

**Utilization Pattern of ICTs by the
Agriculture PG students of College of
Agriculture, JNKVV Jabalpur (M.P.)**

THESIS

Submitted to the
Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur

**In partial fulfilment of the requirement for
the Degree of**

MASTER OF SCIENCE

In

**AGRICULTURE
(EXTENSION EDUCATION)**

By

PRINCE THAKUR

**Department of Extension Education
College of Agriculture, Jabalpur 482004
Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur,
Madhya Pradesh**

2017

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All the assistance and help received during the course of the investigation has been acknowledged by him.

Place: Jabalpur

Dr. V.K. Pyasi

Date:

Chairman of the Advisory Committee

Thesis is Approved by the Student's Advisory Committee

Committee	Name	Signature
Chairman	Dr. V.K. Pyasi	
Member	Dr. N.K. Khare	
Member	Dr. A. Shrivastava	

Thesis is approved by

The Professor and Head
Name seal and signature

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Place: Jabalpur

Dr. V.K. Pyasi

Date:

Chairman of the Advisory Committee

MEMBERS OF THE ADVISORY COMMITTEE

Committee	Name	Signature
Chairman	Dr. V.K. Pyasi	
Member	Dr. N.K. Khare	
Member	Dr. A. Shrivastava	
Head of the Department	Dr. N. K. Khare	
Director Instructions	Dr. Dharendra Khare	

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I, Prince Thakur, S/o Lokchand Thakur, certify the work embodies in the thesis entitled **“Utilization Pattern of ICTs by the agriculture PG students of College of Agriculture, JNKVV Jabalpur (M.P.)”** is my own first hand bonafide work carried out under the guidance of Dr. V.K. Pyasi at Department of Extension Education, JNKVV, Jabalpur during 2016-2017.

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Date: / /

Place: Jabalpur

**Dr. V.K. Pyasi
(Major Advisor)**

**Prince Thakur
(Student)**

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Place: Jabalpur

Date:/...../2017

(Prince Thakur)

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INTRODUCTION

Information Communication Technologies (ICT) consists of computer hardware, software, Internet and other communication networks and media used to collect, store, process and transmit information in the form of voice, text, data and images. In short, ICT deals with the use of electronic computers and computer software to convert, store, protect, process, transmit and retrieve information. (Anonymous, 2007). ICT revolution is the result of integration of computer technology and communication technology. ICT industry includes all companies that are engaged in production and marketing of hardware, software, services and networking. ICT offers flexibility of time and space.

ICT can bring new information services to the rural areas where the farmer (end user) will have much control, than ever before, over the current information channels. Access to such information sources is a crucial requirement for the sustainable development of the farming systems. They also added that ICT can be of immense help by enabling extension workers into knowledge workers (KW). The emergence of such knowledge workers will result in the realization of the much talked about bottom-up, demand-driven technology generation, assessment, refinement and transfer (Meera et al, 2004).

Information and communication technologies (ICTs)—which include radio and television, as well as newer digital technologies such as computers and the Internet have been touted as potentially powerful enabling tools for educational change and reform. When used appropriately, different ICTs are said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace, raise educational quality and helping make teaching and learning into an engaging, active process connected to real life. However, the experience of introducing different ICTs in the classroom and other educational settings all over the world over the past several decades suggests that the full realization of the potential

educational benefits of ICTs is not automatic. The effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology—indeed, given enough initial capital, getting the technology is the easiest part but also curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing, among others.

The Information Technology Act 2000 emphasized technical higher education, which would help students gain employment in the IT industry and the Science and Technology Policy 2001 called for the teaching of science at school and college levels. However, none of these policies specifically mentioned the use of ICTs for primary or secondary education. Nonetheless, the National Task Force on Information Technology and Software Development (IT Task Force) constituted in July 1998 made specific recommendations stating that computers and the Internet should be made accessible to schools, polytechnics, colleges, and public hospitals in the country by 2003. The Ministry of Information Technology further advocated the recommendations of the Working Group of IT for Masses, which called for 10 PCs in each school, local language software capabilities, Internet connectivity in every school and the inclusion of the private sector in this massive effort.

Conceptually, ICTs are those technologies that can be used to interlink information technology devices such as personal computer, digital camera and players, slide projectors, television with communication technologies such as telephone and the telecommunication networks. Today generation of students are expected to be technological and they are extensively making the use of ICTs in different ways. ICT are used by students for different purpose and education is also part of it.

The new information and communication technologies are among the driving forces of globalisation. They are bringing people together and bringing decision makers unprecedented new tools for development. However, the gap between information 'have' and 'have-nots' is widening, and there is a real danger that the world's poor will be exclude from the emerging knowledge-based global economy.

Information and Communication Technologies form part of the functions of today's complex society. Without this, the present society would be inarticulate chaos devoid of direction and technology floods us with information and entertainment. The influence is tremendous in decisions of government, leap over national frontiers and stimulate trends in society especially in the field of education.

ICT comprises a diverse set of technological tools and resources to create, disseminate, store and manage data and information. Traditional ICT tools e.g. T.V., Radio and Telephone have already established their credibility and effectiveness in promoting the developmental schemes in rural and marginalized areas. The modern ICT tools are computers, internet, and wireless communication technology along with powerful software which can process and integrate sound, text and video into electronic media.

The Information and Communication Technologies (ICTs) can create new opportunities to bridge the gap between information haves and information have-nots in the developing countries (Anonymous, 2000). The task force on India as Knowledge Superpower emphasized the need to harness ICTs for societal transformation (Anonymous, 2001) While the impact of ICT on sectors such as banking, tourism, medicine, engineering, agriculture etc. have been enormous, the uptake of ICT in education is fraught with difficulties (Oliver, 2002). Lack of funding, training among practitioners, motivation and perceived need among teachers to adopt ICT as teaching tools impede the required uptake of ICT in education (Starr, 2001).

The new technologies challenge conventional conception of both teaching and learning methods and materials and by reconfiguring how teachers and learners gain access to knowledge, have radical implications for conventional teaching and learning process. To meet these challenges, schools must embrace the new technologies and appropriate the new ICT tools for learning. They must also move toward transforming the traditional paradigm of learning. There has been alarmingly little progress with respect to ICT and the progress has been quite makeshift. Teacher training

institutions are going in the right direction but they lack the quality, expertise, intensity, attention, momentum etc. The shortage of expertise is not so much in basic digital skills, but in the educational use of ICT.

Teacher education institutions may either assume a leadership role in the transformation of education or be left behind in the swirl of rapid technological change. For education to reap the full benefits of ICT in learning it is essential that perceive and in service teachers are able to effectively use these new tools for learning. Teacher education institution and programmes must provide the leadership for pre-service and in service teachers and model the new pedagogies and tools for learning. They must also provide leadership in determining how the new technologies can best be used in the context of the culture, needs and economic conditions within their country.

The ICT penetration in primary, secondary and higher secondary level is not satisfactory at all. Only a limited number of urban schools and colleges have ICT facilities for education purposes. Increasingly ICT is becoming a tool of problem solving. Computer aided modeling and simulations are now powerful aids of sciences as well as economics and business. The processes in research paradigm-literature searches, collecting relevant articles and data, discussions with other researchers, writing papers, peer review of works and finally journal publications-can now are carried out electronically from a networked PC in a researcher's office. Use of ICT in education management is becoming compelling needs throughout the world.

In India, the need for reforms in education by harnessing new ICTs is increasingly being accepted as essential by universities and cultural organizations across India. The National Policy for ICT in Education, under formulation, highlights the need to integrate ICT as a subject in the curriculum as well as to strengthen the overall teaching learning process. Open and distance education systems in India use EDUSAT and other TV and radio channels for delivering content. But ICT is yet to be used significantly for the delivery of content.

The developments in Information Communication Technology (ICT) should be put into service, both to improve the quality of learning and access to learning. The possibilities of e-learning have to be exploited to the fullest extent, even as we continue to improve the quantity and quality of education through the face-to-face mode. Similarly the traditional face-to-face mode can be further improved by integrating ICT into the curriculum. This would require a continual programme of intensive and extensive exposure to the new pedagogy of learning to teachers as well as students and also additional investment for providing new infrastructure.”
(Panikker, 2009).

Scope and importance of the study

Information and Communication Technologies (ICTs) are being used in various fields since quite some time in education. Apart from making the learning and teaching more interesting the ICTs provide opportunity to the teacher and taught to gain information. Through the integration of these technologies the communication becomes more seamless. Usefulness of ICTs can be gauged by way of its usage now in various countries as one of the basic thing to make teaching and learning more interesting. At the same time ICTs also provide challenge to teacher and students in terms of subject specific ICT resources for each other’s understanding with various kinds of activities. Information and Communication Technologies provide more interactive and less didactic approach, where the class can interact with the content and context of the lessons digitally through the ability to capture, combine and manipulate information from a variety of sources. It is very essential to know the awareness, knowledge, extent of use and constraints faced during the uses of ICT tools. Hence the present study entitled **“Utilization Pattern of ICTs by the agriculture PG students of College of Agriculture, JNKVV Jabalpur (M.P.)”** was conducted during 2016 at College of Agriculture, Jawahar Lal Nehru Krishi Vishwa Vidyalaya, Jabalpur (MP) with the following.

Objectives:-

1. To study the profile of Agriculture post graduate students
2. To study the utilization pattern of ICTs by the agriculture post graduate students
3. To study the perception of students about ICTs, and
4. To obtain the constraints about use of ICTs and their suggestions for effective utilization

Limitation of the study

Due to limitation of time, money and other resources to the student researcher, the present investigation was confined only Collage of Agriculture, Jawahar Lal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.) Sample included students of postgraduate. Sample size consisted of only 120 students because of the time constraint.

REVIEW OF LITERATURE

One of the important aspects of research is the review of past literature. The researcher has to review the concerning literature at every stage. It is not a one shot exercise but a continuous process, while going through the literature, the researchers get acquainted with the subject-matter, techniques and materials and guide his efforts in desirable direction. Through review, researcher comes to know about the methods, procedures and techniques as well as results of past studies. It provides clues and guidance throughout the research process. Steady efforts were made to compile research findings of the research studies possessing more or less similar characteristics.

2.1 Sex

Raji and Godsy (2010) found 86 per cent boys and 70 per cent girls use mobile phones. Cheaper handsets and affordable call rates have made mobile phones more accessible for students than before. 86 per cent students make use of mobiles for calls, text message and to listen to radio broadcasts. Filming is a favourite with 40 per cent students. GPRS and file sharing are not uncommon.

Parida (2010) studied relationship between age of staff and students with knowledge and utilization of ICT tools. The probable reason for this trend may due to the fact that, irrespective of age the person shows more eagerness to learn new things and to be with a stream of utilizing advanced technology. Knowledge will be gained when somebody having more experiences both practically and theoretically. More exposure brings fineness in knowledge.

2.2.1 Caste

Waman *et al.* (2000) observed that 50 per cent of the agricultural graduates are from the open category, while 23 per cent from SC, ST and NT categories.

Wankhede (2000) observed that 41-42 per cent respondents were scheduled caste, followed by 18.34 per cent from scheduled tribe and 17.20 per cent respondents were from forward caste. The proportion of these caste to backward and dominant 12.78 per cent and 10.56 per cent, respectively.

Singh and Dhillon (2007) observed that the caste of the key communicators was significantly related to the role performed by them.

2.2.2 Language in School Education

Raji and Godsy (2010) found that majority of the students had studied in Malayalam medium schools. Only 34 per cent boys and 39 per cent girls had English as their medium of instruction at school.

Sharma and Hasan (2012) revealed that maximum number of boys respondent (84%) had English medium of schooling, while a limited number of respondents (16%) had Hindi medium in schooling. On the other hand, more than half 88 per cent female student had English medium in schooling, while 12 per cent had Hindi medium schooling.

2.3 Subject of 10+2

Patidar (2002) found that the most of the respondent (54%) had Biology subject, followed by Agriculture (29%) and 6 per cent of respondent had belonged to Mathematics in their Higher Secondary education.

Raghavan (1985) revealed that vocational plans seemed to be influenced by the course studies in class 11th. This was particularly so in case of Arts and Science co-educational schools. Dhaliwal (1988) found that the students from high socio-economic status families mainly aspired for the science degree and those from low income status aspired for arts degree.

Raji and Godsy (2010) found that Students of arts and science colleges, as compared to students of professional courses, do not receive exposure to ICTs since their courses are largely modeled on conventional pedagogy. The three year graduation course does not involve any ICT related activity. There are no ICT programmes to build on the capacity of the

students as visualized by the UGC at the college level. Efforts in this direction are ad hoc, and not systematized.

2.4 Family Background

Lee (1978) observed that occupational and expectations differed significantly depending on regional and school environment and family background.

Jirapue (1991) observed that majority of the agriculture students i.e. 73.43 per cent respondent had urban background. Similarly, most of post graduates students of agriculture had rural background.

2.5 Parents Education

Reddi (1977) found that students whose mothers were educated upto high school level or above, were significantly better adjusted than the children of illiterate mother. There was no difference between the level of adjustment of students whose fathers were educated up to high school.

Gosselin (1983) found that effect of parent's education on male students career aspiration was non- significant. As regards to female students, father education significantly influenced their occupational choice.

2.6 Knowledge about ICT tools

Mishra (2008) suggested that more research and development in the ICT will not only help in the development and information area but will also help people to get skill, knowledge etc.

Reddy (2008) made an effort to present a solution to bridge the information gap by exploiting advances in information technology (IT). A framework was proposed of cost effective agriculture knowledge to the farming community to improve the crop with expertise.

2.7 Accessibility of Selected ICT Tools

Bashir (2007) found that 57 per cent of the respondent were using Internet at their homes, followed by 54 per cent of the respondent answered that they were using it at their departments, 8 per cent were using it at their offices, 10 per cent respondent that they were using it at their friends and

relatives homes 10.5 per cent, 22 per cent were using it at Internet cafés, 8 per cent mentioned other places where they were using Internet, i.e. neighborhood, language institution, etc

Sharma and Hasan (2012) indicated that majority of respondents owned various communication media as mobile phone, internet, newspaper and magazine. Majority of respondent have knowledge about the various software uses in the computer like – MS Word, MS power – point etc.

2.8 Monthly Expenditure Pattern

Patidar (2002) found that annual expenditure of total student that the highest percentage (37%) was noted for fees, followed by 29 per cent for food and 12 per cent for miscellaneous expenses. On an average, 70.80 per cent respondent spent Rs.15, 001 to 30,000 annually on their education in agriculture.

Finch *et al.* (2006) found that over half of students' expenditure is spent on living costs (food, personal items, entertainment, household goods), with housing costs and participation costs representing a further 5th of spending each. The study found that participation costs varied by student „category.

2.9 Family Occupation

Gasselin (1983) found non-significant effects of parent's occupation on male student's career aspirations. Otto (1975) found positive relationship between the level of occupational aspirations of students and the occupation of their parents or guardians. Higher the occupation of parents higher was the occupational aspiration of students.

Parida (2010) found that the probable reason for association could be that the Government service holders are availing facilities and subsidies like education loan, book allowance etc. for their family. So it would help them to purchase more study materials and equipments.

2.10 Family annual income

Chakarborty *et al.* (2000) revealed that annual income were positively and significantly correlated with knowledge gain after radio broadcast.

Maniar (2002) showed that half of the respondents had family income between Rs.10, 001 to 25,000 per month and sixty percent of them belonged to lower socio-economic status.

Raji and Godsy (2010) found that the monthly parental income of 34 per cent students is below Rs. 5000 and that of 46 per cent students is between Rs. 5000 and Rs. 10,000.

2.11 Sources of Awareness

Pandey and Mehta (2003) revealed that the awareness index of more than half of the respondents was medium level. The total utilization pattern in terms of awareness media habit and audience response was of medium level exactly half of the respondents.

Thambiratti (2008) explored that the teacher must create awareness among students about proper use of technology. Teachers can make use of technology to create an appetite for learning among the students.

Thangaraja *et al.* (2008) showed that majority (95.00%) of the students were aware about the availability of online journals in their respective subjects.

2.12 Time spend purpose

Zakaria, Watson & Edwards (2010) conducted their research on use of web 2.0 technology by Malaysian students. The general opinion gathered about the integration of web 2.0 tools into learning was positive. Result showed that students preferred using e mail to disseminate and share digital contents similarly it was found that for finding information related to education.

Maharana, Biswal & Sahu (2009) explored the use of information communication technology used by medical students they found 77% respondents were of the opinion that ICT should be included in their

syllabus. Nearly all respondent expressed their desired to have a computer lab in their college.

2.13 Perception of Agricultural Post Graduate Students about various ICTs

Anonymous (2001) reported that positive perception of ICT in learning and education was positively related to the ability to use ICT and experience with e-learning technologies. Peh and Foo (2001) reported that better students were more receptive to virtual school of Business (VBUS) while “weaker” students found VBUS more of an added burden than an aid to their already heavy workload.

Rajput *et al.* (2010) indicated that most of the students have positive perception about ICTs and very few perceive negatively. As perception are formed on the basis of our past experience there for positive perception showed that in spite of limited ICTs facilities students still feel quite satisfied with present situation may be because of their positive mind set and cognitive style. Positive perception showed that students wee self – motivated to use ICTs even when ICT infrastructure of university was not so well.

2.14 Attitude of Agricultural Post Graduate Students towards ICTs

Smith and Oosthuizen (2006) showed that there is a greater appreciation of the benefit of computers, less fear of computer power, a more realistic view of computers and also a lesser impression of computer power. The conclusion is reached that less time should be spent in the syllabi on convincing students as to the benefits of computing machinery, as well as allaying fears about computing power.

Inoue (2007) revealed that students” attitudes toward information technology were highly positive. There were no differences in students” perceptions of computer technology experiences between females and males as well as among various academic status groups.

Divaris *et al.* (2007) indicated that the positive attitudes towards the necessity and value of IT for the practicing dentist as well as an important

educational supplement in the dental curriculum were reaffirmed by the fact that two-thirds or more of the Greek post-graduate dental students strongly agreed with the statements for computer attitudes, whereas no negative response was given.

Moussa and Khan (2012) stated that majority of the agricultural research scholars had favorable attitude towards internet. There was a non significant agreement between the male and female agricultural research scholars with regard to their level of attitude towards internet. The attitude of the agriculture research scholars was favorable towards the statement like “Knowledge of internet is essential for agricultural research scholars”, “Internet is important like others research tools” and “Internet is important like other research tools”. There was a significant correlation between male and female agricultural research scholars with regard to their attitude towards different statement about internet.

2.15 Extent of Utilization of information and communication technology

Kumar *et al.* (2008) observed the utilization of computer based information technology by undergraduate students. The study indicated that 4th year students use more computer than 1st year students for writing assignment, presentation and e-mail. In 4th year students frequency of use for computer is more than that of 1st year students

Gulati (2009) reported that high speed broadband connectivity for rural areas is a vital component of inclusive growth. It can provide villagers with much needed access to financial inclusion, health and education services.

Singh *et al.* (2009) noticed that 30.7 per cent of respondents use Internet to little extent, 28.8 per cent to some extents and 13.1 per cent of respondents use Internet to full extent. However 27.4 per cent of respondents are non-users of Internet.

Mishra *et al.* (2011) observed that students who have high information motivations are more likely to engage in human- machine interaction on a

web site, whereas social interaction on a web site, whereas social interaction motivations are more strongly related to human – human interaction through email chatting. Habit strength was the most powerful predictor of news consumption overall.

Dash and Mishra (2012) revealed that student are computer and internet friendly as cent percent student use internet, a majority of student used internet for information and academic purpose while students are motivated for using the internet because one is able to access and practice internet.

Raksha *et al.*(2012) noted that the use and important of ICTs will be felt more important not only in the field of agriculture education for the regular registered students but also for the capacity building of the officers at various levels and the former.

2.16 Constraints

Thangaraja (2008) opined that majority of the students faced problems like getting user name, password, and long time to download article, read only content and limited availability of online journals during access and usage of online journals.

Singh *et al.* (2009) studied that the difficulties in browsing the Internet based information resources. It was found that low speed Internet access, erratic power supply and lack of required full text journals are problems with regards to the use of internet based e-resource..

Dash and Mishra (2012) revealed that time taken to connect to the websites in the most imported factor affecting an enjoyable internet experience and slow internet speed was one of the major barriers in using internet.

2.17 Suggestions

Satyanarayan and Mishra (2001) found that 80 per cent of the users make use of Internet and out of 10 per cent users are not able to find relevant research information. They also found that 90 per cent of the users wanted training for Internet. The study suggested that a user friendly

environment in the library and training for the users in informations search and internet services should be provided.

Parida (2010) found that most of the staff and students suggested that provision of Internet connection for each computer (83.69%), followed by training by the host institution (79.89%) and enhancement of computer facility (77.71%).

Dash and Mishra (2012) revealed that a majority of students (71.29%) feel that bandwidth to overcome the problem of slow internet connectivity followed such as increase in the capacity of and installation of firewalls for protection from viruses by 60.89 per cent students, 37.62 per cent students suggested internet service should be increase and if possible, the service should be made available round the clock so that users can make maximum use of the internet facility, academic news should be provided at the collage website and it should be regularly updated is felt by 37.62 per cent of the student. However, 6.93 per cent student didn't furnish any suggestions.

MATERIAL AND METHODS

Research methodology is the blue print of the research architect. In this chapter, it is attempted to critically evaluate and explain the various methods and procedures followed in the present study in order to enable the researcher to answer the research problems in question. A detailed description of the methods and procedures followed in carrying out the research is furnished under the following heads;

- 3.1 Location of the study
- 3.2 Selection of the population
- 3.3 Selection of the respondents
- 3.4 Selection of ICT tools
- 3.5 Variables selected for the study
- 3.6 Operationalization of independent variables and their measurement
- 3.7 Operationalization of dependent variable and their measurement
- 3.8 Constraints faced by the respondent in utilization of information and communication technology
- 3.9 Suggestions about effective utilization of information and communication technology
- 3.10 Type of data
- 3.11 Developing the interview schedule
- 3.12 Validity
- 3.13 Reliability
- 3.14 Method of data collection
- 3.15 Statistical analysis

3.1 Location of the study

The present study was conducted in the college of Agriculture, Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur.

3.2 Selection of the population

Population of the study consists of student studying in M.Sc. (A.g.) final & previous year in during the session 2016-17 and this campus has maximum number of students studying in post graduation.

3.3 Selection of the respondents

There are around 394 (previous + final) students registered and studying in P.G. during 2016-17, students were selected randomly for this study. In this way total 120 (60 previous + 60 final) post graduate students were considered as respondents for the present study.

3.4 Selection of ICT tools

Information and Communication Technology include use of computers, audio and video conferencing, networks and internet etc. in teaching for all level of education. Our educational sector must use ICT to replace or supplement the classroom teaching. These technologies can be used to reach geographically dispersed students; minimum attention is being paid to the effectiveness of each and combination of technologies for education. Through ICT, the role of teacher changes from that of instructor to that of a facilitator. Different kinds of ICT tools are available in this world. In this study four ICT tools were selected after relevant review of literature, getting suggestions and guidance from the experts. The ICT tools selected for the study were Internet/Web services, Television, Radio and Mobile

3.5.1 Independent Variables

The following independent and dependent variables have been included in this investigation.

Perception

1. The ability to see, hear or become aware of something through the senses.
2. The way in which something is regarded understood or interpreted.

(A)	Independent Variables (X)	Measurement
1.	Sex (X1)	Self-scoring
2.	Caste (X2)	Self-scoring
3.	Language in school education (X3)	Self-scoring
4.	Subject 10+2 (X4)	Self-scoring
5.	Family background (X5)	Self-scoring
6.	Parents education (X6)	Self-scoring
7.	Knowledge about ICT Tools (X7)	Self-scoring
8.	Accessibility of ICT Tools (X8)	Self-scoring
9.	Monthly expenditure pattern (X9)	in rupees
10.	Family occupation (X10)	Self-scoring
11.	Family annual income (X11)	in rupees
12.	Source of awareness (X12)	Self-scoring
13.	Time spend purpose (X13)	Self-scoring
14.	Perception about ICTs (X14)	Self-scoring
15.	Attitude towards ICTs (X15)	Self-scoring
(B)	Dependent Variable	Measurement
	Extent of utilization of information and communication technology	index developed

3.5.2 Dependent Variable

Extent of utilization of information and communication technology

3.6 Operationalization of independent variables and their measurement

3.6.1 Sex

Sex of the respondents was categorized as follows for analysis and presentation:

Categories	Score
Male	1
Female	2

3.6.2 Caste

Caste as an endogamous and hereditary subdivision of an ethnic unit occupying a position of superior rank or social esteem in comparison to other sub division, In this study the caste of the respondents were categorized in following manner:

Categories	Score
Schedule tribe (ST)	1
Scheduled caste(SC)	2
Other backward class (OBC)	3
General	4

3.6.3 Language in school education

Medium of school education of the respondents was categorized as follows:

Categories	Score
Hindi	1
English	2
Other	3

3.6.4 Subject of 10+2

Subject of students in higher secondary was recorded and categorized as follows for presentation and analysis purpose:

Categories	Score
Agriculture	1
Biology	2
Mathematics	3

3.6.5 Family background

Parental residential background of the respondents was categorized as follows:

Categories	Score
Village	1
Town	2
City	3

3.6.6 Parents education

The reading and writing ability acquired through formal education by the parents of the respondents was considered as their education status and it was Categorized as under:

Categories	Score	
	Fathers	Mothers
Illiterate	1	1
Up to middle	2	2
Higher secondary	3	3
Graduation / Diploma	4	4
Post graduation	5	5

6.6.7 knowledge about ICTs tools

Knowledge about how to use different tools:

Categories	Score
Low (0-3 score)	1
Medium (4-6 score)	2
High (above 6 score)	3

3.6.8 Accessibility of selected ICT tools

The accessibility to computer was categorized into four types i.e. self owned, department owned use on rent and others.

Categories	Score
Self owned	1
Departmental	2
Use on rent	3
Other	4

3.6.9 Monthly expenditure pattern

It is the amount of money which is being spend by the respondents during their annual educational period on different modes. Annual expenditure pattern of the respondents was categorized as follows:

Categories	Score
Up to Rs. 3000	1
Rs. 3001 – Rs. 4000	2
Rs. 4001 –Rs. 5000	3
Rs. 5001 –Rs. 7000	4
> Rs.7000	5

3.6.10 Family Occupation

Occupation refers to the cadre of the persons in which they were working. Here the occupation of respondent's family is classified as suggested by Uma (2002) with partial modification in the following categories:

Categories	Score
Govt. Service	1
Private Service	2
Business	3
Agriculture	4
Other 5	5

3.6.11 Family annual income:

In the study, total annual income from all the available sources of respondent's family were calculated and then the respondents were categorized in the following manner:

Categories	Score
Up to Rs.1,00,000	1
Rs.1,00,001 – Rs 2,00,000	2
Rs.2,00,001 –Rs. 3,00,000	3
Rs.3,00,001 – Rs.4,00,000	4
More than Rs.4,00,001	5

3.6.12 Sources of awareness

The sources of awareness were classified under following categories;

Categories	Score
Radio	1
T.V.	2
Print media	3
Friends	4
Others	5

3.6.13 Time spend purpose

There are various purpose of time spend

Purpose	Score	
	Yes	No
Research	1	0
Teaching	1	0
Learning	1	0
Entertainment	1	0
Other	1	0

3.6.14 Perception of agricultural post graduate students about various ICTs

It refers to the degree to which perception of agricultural post graduate students toward information and communication technology. The perception scale followed by Rajput *et al.* (2010) was used for the measurement of perception of respondents. The statements of the original scale were suitably modified to measure the perception of respondents. The selected 10 statements for final perception scale were randomly arranged to avoid the bias during collection of responses. The fifteen statements are provided along with three columns representing three point continuum for degree of full agree, partial agree and not agree. The three point on continuum were full agree, partial agree and not agree with respective weight of 2, 1 and 0 for the favourable or positive statements and 0, 1 and 2 in case of unfavourable or negative statements. The sums of scores of all

the fifteen statement were worked out. There after, the respondents were categorized into following groups:

Degree of perception	Score
Low (0 to 06 scores)	1
Medium (07 to 13 scores)	2
High (Above 13 scores)	3

3.6.15 Attitude of agricultural post graduate students towards ICTs

It refers to the degree to which attitude of respondent toward information and communication technology. The attitude scale followed by Raksha *et al.* (2012) was used for the measurement of attitude of respondents. The statements of the original scale were suitably modified to measure the attitude of respondents. The selected 10 statements for final attitude scale were randomly arranged to avoid the bias during collection of responses. The twenty statements are provided along with five columns representing five point continuum for degree of agreement and disagreement to the respective statements as followed by Likert (1932).The five point on continuum were strongly agree, agree, undecided, disagree and strongly disagree with respective weight of 4, 3, 2, 1 and 0 for the favourable or positive statements and 0, 1, 2, 3 and 4 in case of unfavourable or negative statements. The sums of scores of all the twenty statement were worked out. The respondents were categorized into following groups:

Category	Score
Low (0 to 13 scores)	1
Medium (14 to 26 scores)	2
High (Above 27 scores)	3

3.7 Operationalization of dependent variables and their measurement

3.7.1 Extent of utilization of information and communication technology

It refers to which extent of utilization of information and communication technology. Four ICT tools were selected and utilization of each tool for different way. Utilization was measured with three column representing three point regular, rarely and never with the weight of 2, 1 and 0, respectively. The sum of score of all the statement was worked out. The respondents were categorized into following groups:

ICT tools	Score
Internet	
Low (0-4)	1
Medium (5-9)	2
High (Above 9)	3
Television	
Low (0-4)	1
Medium (5-9)	2
High (Above 9)	3
Radio	
Low (0-3)	1
Medium (4-6)	2
High (Above 6)	3
Mobile	
Low (0-7)	1
Medium (8-14)	2
High (Above 14)	3

The overall extent of utilization *OEU* of different selected ICT tools were

Calculated using following equation:

$$OEU = \frac{\sum Xi}{TOS} \times 100$$

Where,

OEU = Over all extent of ICT tools Utilization

Xi = Score obtained for *ith* tool by individual respondent

TOS = Total obtainable score for all the selected ICT tool

On the basis of *OEU*, the respondents were categorized in to three categories as score were organized as follows:

Category	Score
Low	1
Medium	2
High	3

3.8 Constraints faced by the respondent in utilization of information and communication technology

Simple technique was applied to measure the constraints faced by the respondents in utilization of information and communication technology. Each student was asked to mention his constraints in utilization of information and communication technology. The constraints faced in using ICT tools were categorized on the following basis:

Category	Score
Always	2
Sometimes	1
Never	0

3.9 Suggestions about utilization of information and communication technology for effective utilization

Students were asked to give their valuable suggestions to overcome the constraints faced by them in utilization of information and communication technology. The suggestions offered were summarized on the basis of number and percent of respondents who reported for the respective suggestions.

3.10 Type of data

The following types of the data were obtained from the respondent in view of the objectives of the study:

1. Data pertaining to the socio-personal characteristics,
2. Data regarding socio-economic characteristics,
3. Data regarding socio-psychological,
4. Data regarding communicational, and
5. Data regarding constraints/problems and suggestion as perceived by respondents on relating to utilization pattern of information pattern of ICT.

3.11 Developing the interview schedule

The interview schedule was designed on the basis of objectives and independent and dependent variables in the present investigation. Each question was thoroughly examined and discussed with the experts before finalizing the interview schedule. Adequate precautions and care were taken into consideration to formulate the questions in a manner that they were well understood by the respondents and would find it easier to respond.

The prepared interview schedule was used in the study area for collecting the data. On the basis of experience gained in pre-testing, the necessary modifications and suggestions were incorporated before giving a final touch to interview schedule.

3.12 Validity

Validity refers to “the degree to which the data collection instruments measures what it is supposed to measure rather than something else”. The validity of interview schedule used for this study was maximized by taking following steps:

1. The interview schedule was thoroughly discussed with the concerned scientists and member of advisory committee and their suggestions were incorporated.
2. Pre-testing of interview schedule provided an additional check for improving the instrument.

3. The relevancy of each question in terms of objectives of study, their logical order and wordings of each question was checked carefully.

3.13 Reliability

Reliability of an interview schedule refers to “its consistency or stability in obtaining information from respondents”. The test-retest method of estimating reliability of an interview schedule was followed in this study.

3.14 Method of data collection

Respondents were interviewed through personal interview. Prior to interview, respondents were taken into confidence by revealing the actual purpose of the study and also full care was taken to develop good report with them. They were assured that the information given by them would be kept confidential. The interview was conducted in the most formal and friendly atmosphere without any complications.

3.15 Statistical analysis

The data collected during the course of investigation was tabulated into the coding sheet and then appropriate analysis of data was made according to objectives as suggested by Cochran and Cox (1957). The statistics techniques were applied in the form of frequency, percentage, mean standard deviation, coefficient of correlation, etc.

RESULTS

Information and Communication Technology comprises a diverse set of technological tools and resources to create, disseminate, store and manage data and information. Thus with this philosophy in mind, an attempt was made to study on utilization pattern of Information and Communication Technology (ICTs) by the agriculture post graduate students.

This chapter deals with the results obtained on various aspects of the study and supported with suitable discussion on each findings. The data were collected through the interview schedule on the basis of objectives of the study. The data collected were classified, tabulated, analyzed, presented, interpreted and discussed systematically. The findings of the study are presented and discussed under the following heads:

1. To study the profile of Agriculture post graduate students,
2. To study the utilization pattern of ICTs by the agriculture post graduate students,
3. To study the perception of students about ICTs, and
4. To obtain the constraints about use of ICTs and their suggestions for effective utilization.

4.1 Independent variables

Table 4.1: Distribution of respondents according to their sex

(n=120)

Characteristics	Frequency	Percentage
Male	78	65.00
Female	42	35.00
Total	120	100.00

The data regarding sex are presented in Table 4.1. It was found that majority of the respondents belong to male (65.00%) category than female (35.00%).

Therefore, it can be conducted the majority (65.00%) of respondents belongs to male category followed by female.

Table 4.2 Distribution of respondents according to their caste

(n=120)

Characteristics	Frequency	Percentage
Scheduled tribe	33	27.89
Scheduled caste	23	19.47
Other backward class	37	30.53
General	27	22.11
Total	120	100.00

The data presented in Table 4.2 indicated that the maximum percentage of the respondents (30.53%) belonged to OBC, category followed by 27.89 per cent of the respondents scheduled tribe, 22.11 of the respondents belong to general caste and only 19.47 per cent of the respondents belonged to scheduled caste.

Hence, it can be concluded the maximum percentage (30.53%) of respondents belongs to other backward class.

Table 4.3. Distribution of respondents according to their Language in school education

(n=120)

Particulars	Frequency	Percentage
Hindi	81	67.89
English	34	28.42
Others	05	03.69
Total	120	100.00

The data regarding language in school education is presented in Table 4.3, show that majority (67.89%) of the respondents have joined the college from Hindi medium, followed by 28.42 per cent of the respondents

studied in English medium and only 3.69 percent students belong to other medium.

Therefore, it can be concluded that the highest percentage (67.89%) of respondents belongs to Hindi language in school education followed by English medium (28.42%).

Table 4.4. Distribution of respondents according to their Subject in higher secondary (10+2)

(n=120)

Particulars	Frequency	Percentage
Agriculture	34	28.34
Biology	59	49.16
Mathematics	27	22.50
Total	120	100.00

The data regarding major subject of 10+2 is presented in Table 4.4. It indicate that majority of the respondents (49.16%) were having biology as major subject, followed by agriculture subject (28.33%) and (22.50%) per cent of respondents were having mathematics in their higher secondary education.

Therefore, it can be concluded the majority (49.16%) of respondents belongs to biology group.

Table 4.5. Distribution of respondents according to their family background

(n=120)

Particulars	Frequency	Percentage
Village	60	50.00
Town	37	30.53
City	23	19.47
Total	120	100.00

The data regarding parental residential background presented in Table 4.5 indicated that fifty per cent of the respondents (50%) belonged to village, followed by 30.53 per cent from town and 19.47 per cent from city.

Therefore, it can be concluded the belonged to (50.00 %) of respondents higher percentage of family background of respondents belongs to village followed by town (30.53%).

Table 4.6. Distribution of respondents according to their parents education

(n=120)

Particulars	Father's		Mother's	
	Frequency	Percentage	Frequency	Percentage
Illiterate	00	00.00	00	00.00
Up to middle	13	10.53	45	37.50
Higher secondary	37	31.05	41	34.16
Under graduation	45	37.37	25	20.84
Post Graduation	25	21.05	09	07.50
Total	120	100.00	120	100.00

The data related to parent's education are presented in table 4.6. It shows that 37.37 per cent of the respondents father had under graduation / Diploma level of educational background, while 37.50 per cent of respondents mothers were educated up to middle level of education. Thus, the data indicated that the majority of students respondents belonged to the educated family.

Therefore, it can be concluded that 37.37 per cent fathers education was under graduation and 37.50 per cent mothers of the respondents were having education up to middle school.

Table 4.7. Distribution of respondents according to their Knowledge about ICT's Tools

(n=120)

Categories	Frequency	Percentage
Low	13	10.84
Medium	62	51.66
High	43	37.50
Total	120	100.00

The data regarding knowledge about ICT tools presented in table 4.7. Shows 51.33 per cent of the respondents students were having medium knowledge while 37.50 per cent in high and 10.83 per cent had low level of knowledge.

Therefore, it can be concluded that the highest percentage (51.66%) of the respondents belongs to medium level of knowledge.

Table 4.8a. Distribution of respondents according to accessibility of ICT's tools

(n=120)

Accessibility*	Desktop	Laptop	Internet	Television	Mobile	Radio
Available	11 (9.47)	100 (83.68)	114 (95.26)	73 (60.83)	120 (100)	77 (64.21)
Not available	109 (90.53)	20 (16.31)	06 (4.73)	47 (39.16)	00 (00.00)	43 (35.78)

Data based on multiple responses

The Data presented in Table 4.8. regarding accessibility of selected ICT tools are indicate that cent per cent student had mobile phone, followed by 95.26 per cent student had internet connectivity, 94.21 per cent students had access to television, 83.68 per cent students had laptop, 64.21 per cent students had radio and only 9.47 per cent students had desktop computer.

Therefore, it can be concluded that 100.00 per cent of respondents use of ICT tools was mobile followed by internet (95.26%).

Table 4.8b. Distribution of respondents according to use of selected ICT tools

(n=120)

ICT tools	Frequency*	Percentage
Internet	120	100.00
Television	112	93.15
Radio	44	36.84
Mobile	120	100.00

Data based on multiple responses

Use of Selected ICT tools

Regarding use of selected ICT tools table 4.8b represents that cent per cent of the students using internet and mobile, 93.15 per cent students watch TV and 36.84 per cent students listen radio.

Table 4.8c. Distribution of respondents according to using the selected ICT tools

ICT tools	Regularly F (%)	Rarely F (%)	Never F (%)
Internet	83 (69.47)	37 (30.53)	00 (00.00)
Television	63 (52.11)	49 (41.05)	08 (6.84)
Radio	06 (5.26)	39 (31.58)	76 (63.16)
Mobile	111 (92.11)	09 (7.89)	00 (00.00)

Frequency of using the selected ICT tools

Table 4.8c and Fig 4.6 represent the frequency of using the selected ICT tools among the respondents. Regarding internet, 69.47 per cent students using internet regular, followed by 30.53 per cent rarely. Regarding television, 52.11 per cent students watching television daily, followed by 41.05 per cent rarely and only 6.84 percent students never watching television.

Table 4.9a. Distribution of respondents according to monthly expenditure excluding fees
(n=120)

Monthly Expenditure	Frequency	Percentages
Up to Rs. 3000	38	31.59
Rs. 3001 – 4000	40	33.68
Rs. 4001 – 5000	20	16.31
Rs. 5001 – 7000	15	12.10
> Rs. 7000	07	06.32
Total	120	100.00

Average monthly expenditure Rs. 4006

The data are presented in Table 4.9a and Fig 4.1 regarding monthly expenditure (excluding fees). Its indicate that about maximum 34 per cent of the respondents made monthly expenditure in the range between Rs.3001-4000, followed by 31.59 per cent of the respondents had monthly expenditure up to Rs. 3000, 16.31 per cent of the respondents had monthly expenditure between Rs.4001-5000, 12.10 per cent of the respondents had monthly expenditure between Rs. 5001-7000 and the lowest percentage of respondents (6.32%) had monthly expenditure more than Rs.7000. The average monthly expenditure of P.G. students excluding fees is Rs.4006.

Table 4.9b. Distribution of respondents according to monthly expenditure pattern

Particular	Average expenditure (Rs.)	Percentages
Regular food and hoteling	1800	44.93
Books	384	9.58
Internet	116	2.89
Mobile recharge	213	5.35
Fuels' and Transportation	271	6.76
Movies, Drink & Smoking	519	12.95
Shopping	703	17.54
Total	4006	100.00

The data presented in Table 4.9b and Fig 4.2, regarding monthly expenditure pattern are it indicates that maximum number of respondents 44.93 per cent spent their money on regular food and hoteling, followed by 17.54 per cent in shopping, 12.95 per cent in movies, drinks, smoking and entertainment, 9.58 per cent in books, 6.76 per cent in fuels and transportation, 5.31 per cent in mobile recharge and 2.89 per cent in internet.

Therefore, it can be concluded that the maximum percentage (44.93%) of respondents comes under Rs. 3001- 4000 followed by (31.59%) in up to 3000.

Table 4.10. Distribution of respondents according to occupational background

(n=120)

Particular	Frequency	Percentage
Govt. service	60	50.00
Private service	07	05.84
Business	16	13.33
Agriculture (farming)	33	27.50
Others	04	03.33
Total	120	100.00

The data presented in Table 4.10 show regarding occupational background is that more than fifty percentage of the respondents (50.00%) were belonging to families of Govt. service, followed by 27.50 per cent were related with farming background families. Parents of 13.33 per cent respondents were doing business and 05.84 per cent were doing private service and parents of 03.33 per cent were employed in other occupations.

Therefore, it can be concluded that the maximum percentage (50.00%) of respondents occupation background of family of respondents is government service followed by 27.50 per cent in agriculture.

Table 4.11. Distribution of respondents according to annual income of their family

(n=120)

Particular	Frequency	Percentage
Up to 1,00,000	16	13.69
Rs. 1,00,001 – 2,00,000	28	23.68
Rs. 2,00,001– 3,00,000	27	22.63
Rs. 3,00,001– 4,00,000	37	31.05
More than 4,00,001	12	08.95
Total	120	100.00

The data are presented in Table 4.11. with regards to annual family income the maximum percentage of respondents (31.05%) were having their family annual income in the range of Rs. 3,00,001 – 4,00,000, followed by 23.68 per cent of respondents had their annual income in the range between Rs. 1,00,001 – 2,00,000, while 22.63 per cent of the respondents had obtained family income in the range between Rs. 2,00,001 – 3,00,000 and only 8.95 per cent of respondents belonged to very high income family with above Rs. 4,00,001.

Thus, it can be inferred that majority (31.05%) of respondents family annual income had Rs.3, 00,001 - 4, 00,000.

Table 4.12. Distribution of respondents according to source of awareness about ICT tools

(n=120)

Source of information	Frequency*	Percentage	Rank
Radio	13	11.05	V
Television	65	54.52	II
Print media	54	45.26	III
Friends/ relative	90	75.26	I
Others	32	26.31	IV

*Data based on multiple responses

Data regarding sources of awareness about ICT tools is presented in Table 4.12 and Fig. 4.3. The result reveal that majority of the respondents (75.26%) were getting awareness about different ICT tools from friends and relatives, followed by TV (54.52%), print media (45.26%) and other like magazine, mobile, exhibition (26.31%).

Therefore, it can be concluded that majority (75.26%) of the respondents had friends / relative is medium of sources of awareness followed by print media (45.26%)

Table 4.13. Distribution of respondents according to their time spend purpose

(n=120)

Purpose	Frequency*	Percentage	Rank
Research	47	39.16	I
Teaching	36	30.00	IV
Learning	42	35.00	III
Entertainment	45	37.50	II
Others	18	15.00	V

*Data based on multiple responses

Data regarding time spend purpose of ICTs presented in table no 4.13 respondents are spend maximum time in 39.16 in research followed by 37.50% in entertainment , 35.00% in learning , 30.00% in teaching related and 15.00 % in others majority.

Thus, it can be concluded that the highest percentage (39.16%) of respondents belonged spending time in research activities on proper time. research in time spend purpose.

Table 4.14. Distribution of respondents according to perception about ICTs

(n=120)

Degree of perception	Frequency	Percentage
Less favourable (0 to 06 scores)	04	03.68
Favourable (07-13 scores)	76	63.16
Highly favourable (Above 13 scores)	40	33.16
Total	120	100.00

The data presented in Table 4.14 and Fig. 4.4 regarding perception of students about ICTs was recorded and the results revealed that majority of respondents (63.16%) were having favorable perception about ICTs, followed by 33.16 per cent of the respondents were having highly favorable perception towards ICTs and only 3.68 per cent of the respondents were found in the less favorable perception categories.

Thus, it can be concluded that the majority (63.13%) of respondents belonged to favorable degree of perception followed by highly favorable degree of perception.

Table 4.15. Distribution of respondents according to their attitude towards ICTs

(n=120)

Level of attitude	Frequency	Percentage
Less favourable (0 to 13 scores)	04	03.68
Favorable (14 - 26 scores)	11	09.47
Highly favourable (Above 27 scores)	105	86.85
Total	120	100.00

The data presented in Table 4.15 and Fig. 4.5 regarding attitude of students towards ICTs was recorded and the results revealed that majority of respondents (86.84%) had more favorable attitude towards ICTs, followed by 9.47 per cent of the respondents having favorable attitude towards ICTs and 3.68 per cent of the respondents had low level of perception about ICTs.

Hence, it can be concluded that the majority (86.84%) of respondents were having highly favorable attitude towards ICT tools.

1. Utilization pattern of internet:

Table 4.16. Distribution of respondents according to purpose of using internet
(n=120)

Purpose	Frequency*	Percentage
News	71	58.95
Entertainment	77	64.21
Information	85	70.53
Games	57	47.89
Academic purpose	37	31.05
e-mail	69	57.37
Buying tickets	49	40.52
Chatting & game	57	47.89
Job search	66	55.26
Shopping	13	10.52

*Data are based on multiple responses

Table 4.16 represents the purpose of using internet by the students. The result revealed that the majority of respondents (70.53%) used internet for getting information, followed by entertainment (64.21%), news (58.95%), E-mail (57.37%), job search (55.26%), chatting and game (47.89%), buying tickets (40.52%), (40.52%), shopping (10.52%), respectively. About 31 per cent of the students were also using the internet for academic purpose. Kirat (2003), Mishra *et al.* (2005) and Dash *et al.* (2012) also noted almost similar findings regarding utilization of internet.

Table 4.17. Distribution of respondents according to sites mostly used

(n=120)

Sites	Frequency*	Percentage
Google	112	93.68
Rediff	15	12.10
Khoj	32	26.84
ICAR	42	34.73
Facebook	104	86.84

*Data are based on multiple responses

As regards Table 4.17 indicates that, to sites mostly used, the data presented in 93.68 per cent respondents used Google for searching information, followed by facebook (86.84%), ICAR (34.73%), khoj (26.84%), Rediff (12.10). Kaur and Manhas (2008) and Mishra *et al.* (2011) were also reported almost similar findings.

Table 4.18. Distribution of respondents according to pattern of utilizing information retrieved from internet

(n=120)

Utilizing Pattern	Frequency*	Percentage
By noting down	71	58.94
By discussing it with friend	45	37.89
Retain in the memory	57	47.80
Download in the CD/Pen	83	68.94
Taking a print out instantly	19	15.78

*Data are based on multiple responses

The data regarding pattern of utilizing information retrieved from Internet are presented in Table 4.18. It reveals that the majority of the respondents (68.94%) retains the information by downloading it into the CD, pen drive, computer, mobile etc. followed by noting down useful information (58.94%), retain in the memory (47.80%) and by discussing it with friends

(37.89%). Some of the students were taking a printout instantly (15.78%). Dash and Mishra (2012) also noted almost similar findings.

2. Utilization pattern of television

Table 4.19. Purpose of watching television

(n=112)

Purpose	Frequency*	Percentage
News channels	82	72.88
Entertainment (Music, Movies etc.)	86	76.83
Health related information	49	43.50
Current affairs Information	58	51.98
Religious information	40	35.59
For particular programme (Serial)	53	47.46

*Data based on multiple responses

The Table 4.19 represents the purpose of watching television by the students. The finding shows that the majority (76.83%) of the students watched television for entertainment followed by news channels (72.88%), current affairs information. (51.98%), for particular programme (47.46%), health related information (43.50%), religious information (35.59%), The results are supported with findings of Bisht *et al.* (2007) and Mishra *et al* (2011).

Table 4.20. Distribution of respondents according to channels preferred to watch

(n=112)

Channels	Frequency*	Percentage
News channel		
DD News	47	42.37
ABP News	70	62.15
Aaj Tak	75	67.23
Zee News	57	50.85
NDTV	53	47.26
Entertainment channel		
DD-1	32	28.25
Star Plus	67	59.89
Zee TV	64	57.06
Sony	64	56.49
Colors	63	53.67
Sports channel		
Ten sports	41	36.72
News sports	46	40.68
Others	19	17.37
Other channel		
National Geography	52	46.33
Discovery	60	53.67
Cartoons	47	42.37

*Data based on multiple responses

The findings regarding channels preferred in television by the respondents are presented in Table 4.20. Regarding news channel, majority of the students (67.23%) watch Aaj tak, followed by ABP news (62.15%), Zee news (50.85%), NDTV (47.26%), DD News (42.37%). As regards to entertainment channels, 59.89 per cent watch Star plus, 57.06 per cent watch Zee TV and 9xm, 56.49 per cent watch Sony and 53.67 per cent watch Colors. Less than 50 per cent students watch DD-1, regarding sports

channel, News sports channel were watched by 40.68 per cent, Ten sports were watched by 36.72 per cent students and other (17.37%). As regard to other channel, 53.67 per cent students watch Discovery channel, National geography watched by 46.33 per cent students and Cartoons channel are watch by 42.37 per cent students.

Table 4.21. Distribution of respondents according to pattern of utilizing information after watching television
(n=112)

Utilizing Pattern	Frequency*	Percentage
By noting down	50	44.63
By discussing it with friends	77	68.93
Retain in the memory	89	79.09

*Data based on multiple responses

The response of students regarding pattern of utilizing information after watching television are presented in Table 4.21. The result reveal that majority of the students (79.09%) retain the information in the memory, followed by discussing it with friends (68.93%), noting down (44.63%) and incorporate it in behavior (34.46%). Almost similar findings were reported by Bisht *et al.* (2007) and Mishra *et al* (2011).

3. Utilization pattern of radio:

Table 4.22. Purpose of listening radio

(n=44)

Purpose	Frequency*	Percentage
News	8	17.14
Entertainment	43	97.14
Current affairs	12	27.14
Political events	6	12.86
Job vacancy	1	2.85
Others	2	4.28

*Data based on multiple responses

Table 4.22 represents the purpose of listening radio by the students. The result shows that 97.14 per cent of the students listened radio for entertainment, followed by for current affairs information (27.14%), news (17.14%), political events (12.86%), job vacancy (2.85%) and other purpose (4.28%). Mishra *et al.* (2011) also noted almost similar findings.

Table 4.23. Distribution of respondents according to programmes often listened radio

(n=44)

Programmes	Frequency*	Percentage
Songs	38	86.36
News	10	22.27
Special feature	08	18.18
Sports commentary	06	13.63
Agriculture programmes	01	02.27
Others	07	15.09

*Data based on multiple responses

The findings related to programmes often listened in radio are present in Table 4.23. It reveals that, 86.36 per cent of the students often listened song on the radio, followed by news (22.27%), special feature (18.18%), sports commentary (13.63%), agriculture programmes (02.27%). Mishra *et al.* (2011) also reported almost similar findings.

Table4.24. Distribution of respondents according to pattern of utilizing information after listening radio

(n=44)

Utilizing Pattern	Frequency*	Percentage
Note down the important information	05	11.36
By discussing it with friends	35	79.54
Retain in the memory	26	59.09
Use it for preparation for the competitive exams	01	02.27
Others	05	11.36

The data regarding pattern of utilizing information after listening radio (Table 4.24) reveals that, 79.54 per cent of the students discussing it with friends followed by 59.09 per cent students retain in the memory, 11.36 per cent note down the important information, 02.27 per cent use it for preparation for the competitive exams and 11.36 per cent of use for other purpose. Almost similar findings were reported by Bisht *et al.* (2007) and Mishra *et al.* (2011).

4. Utilization pattern of mobile

Table 4.25. Distribution of respondents according to mobile use
(n=120)

Function	Frequency*	Percentage
Send and receive text message/MMs	120	100.00
Play games	120	100.00
Take picture	99	82.10
Play music or MP3 films	98	81.57
Play videos	76	63.15
Record videos	68	56.84
Access the internet or web sites	76	63.68
Send and receive mail	57	47.89
Listen radio programmes	57	47.36

*Data based on multiple responses

Regarding mobile use, the result revealed (Table.4.25) that all the students used mobile phones had the capabilities to send and receive messages, play games. The result further reveals that, 82.10 per cent students use to take picture, followed by 81.57 per cent students used to play music or MP3 films, 63.68 per cent students used it for internet or web sites, 63.15 per cent students used mobile for play videos, 56.84 per cent students' used to record videos and less than 50 per cent students used mobile phone for send and receive mail, listen radio programmes.

Table 4.26. Distribution of respondents according to utilization of mobile phone
(n=120)

Category	Frequency*	Percentage
General purpose		
Contact with parents	120	100.00
Social interaction	75	62.63
Contact with friends, batch mates and colleagues	114	94.74
Internet or web usage		
Download songs and videos or ring tones	69	57.36
Get News or weather online	39	32.10
Send and receive mail	57	47.36
Information about Job	44	36.84
Face book , whatsapp	62	51.57
Information about books , movies or other leisure Activities	32	26.31
Other (Photography, health and medical services	38	31.57

*Data based on multiple responses

Regarding purpose of using mobile phones the data is presented in Table 4.26. The results reveals that majority of the students (94.74%) were using mobile phone for contact with friends, batch mates and colleagues, followed by 88.94 per cent students using mobile phone for contact with parents and 62.63 per cent students used for social interaction.

The findings regarding Internet or web usage on mobile are presented in Table 4.26. The results shows that the more than half of the students (57.36%) used the internet on mobile phone for download songs and videos or ring tones, followed by 51.57 per cent used for facebook and whatsapp, 47.36 per cent used for send and receive mail, 36.84 per cent used for getting information about job, 32.10 per cent used to get News or weather online, 31.57 per cent used for other purpose like; photography, health and medical service etc. and 26.31 per cent of the students used for getting information about movies, books or other leisure activities.

4.2 Dependent variable

4.2.1 Extent of utilization of information and communication technology

The findings regarding extent of utilization of internet are presented in Table 4.27 indicated that 42.63 per cent of students utilize e-mail rarely, followed by regular utilize (34.21%) and never utilize (23.16%). Regarding information, 45.26 percent of students regular utilize for information, followed by rarely (32.63%) and never utilize for information (22.11%). Regarding knowledge of current affairs, 53.68 percent of students rarely utilize, followed by regular (25.19%) and never utilize (20.53%). Regarding career opportunities, 63.16 per cent of students rarely utilize, followed by never utilize (20.00%) and regular utilize (16.84%). Regarding preparation of resume, 63.68 per cent of students.

Never utilize, followed by rarely (28.95%) and regular utilize (7.37%). Regarding entertainment, 52.63 per cent of the student rarely utilize, followed by regular utilize (32.11%) and never utilize (15.26%). Regarding academic purpose, 49.47 per cent of students rarely utilize, followed by never utilize (37.37%) and regular utilize (13.25%).

The findings regarding extent of utilization of television are present in Table 4.27. As regard to watching news, 65.54 per cent of students utilize rarely, followed by regular utilize (29.38%) and never utilize (5.08%). Regarding Entertainment (Music, Television serial, movies etc.), 50.85 per cent of students rarely utilize, followed by regular utilize (40.68%) and never utilize (8.47%). Regarding sports programmes, 50.28 per cent of students rarely utilize, followed by never utilize (28.81%) and regular utilize (20.90%). Regarding agricultural programmes, 60.46 per cent of students never utilize, followed by rarely utilize (28.24%) and regular utilize (11.30%). Regarding current affairs information, 61.02 per cent of students rarely utilize, followed by regular utilize (28.25%) and never utilize (10.73%). Regarding political news, 45.77 per cent of students never utilize, followed by rarely utilize (40.11%) and regular utilize (14.12%). Regarding educational purpose,

49.16 per cent of the students rarely utilize, followed by 25.42 per cent never utilize and regular utilize.

Table 4.27. Distribution of respondents according to component wise extent of utilization of selected ICT tools

Particulars	Extent of utilize		
	Regular	Rarely	Never
Internet (n =120)			
E-mail	41 (34.21)	51 (42.63)	28 (23.16)
Information	54 (45.26)	39 (32.63)	27 (22.11)
Knowledge of current affairs	31 (25.19)	64 (53.68)	25 (20.53)
Career Opportunities	20 (16.84)	76 (63.16)	24 (20.00)
Preparation of Resume	09 (7.37)	35 (28.95)	76 (63.68)
Entertainment	39 (32.11)	63 (52.63)	18 (15.26)
Academic Purpose	16 (13.26)	59 (49.47)	45 (37.37)
Television (n =112)			
News	33 (29.38)	73 (65.54)	06 (5.08)
Entertainment (Music, Television serial,	46 (40.68)	57 (50.85)	09 (8.47)
Sports programmes	23 (20.90)	60 (50.28)	32 (28.82)
Agricultural programmes	13 (11.30)	32 (28.24)	68 (60.46)
Current affairs Information	32 (28.25)	68(61.02)	12 (10.73)
Political events	16 (14.12)	45 (40.11)	51 (45.77)
Educational purpose	28 (25.42)	55 (49.16)	28 (25.42)
Radio (n =44)			
News (Sports News, Regional News	03 (7.14)	06 (14.14)	33 (75.72)
Youth Programmes	01 (2.86)	06 (14.28)	37 (82.86)
Entertainment (song, commentary etc)	13 (30.00)	24 (55.51)	06 (14.29)
Employment News	00 (0.00)	01 (2.86)	43 (97.14)
Agriculture programmes	00 (0.00)	01 (1.43)	43 (98.57)
Mobile (n =120)			
Send and receive text message/MMs	38 (31.58)	64 (53.16)	18 (15.26)
Play games	39 (32.11)	44 (36.84)	37 (31.05)
Take picture	22 (18.42)	64 (53.16)	34 (28.42)
Play music or MP3 films	57 (47.37)	39 (32.11)	25 (20.52)
Play videos	19 (15.79)	58 (48.42)	43 (35.79)
Record videos	6 (5.26)	47 (38.95)	67 (55.79)
Access the internet or web sites	18(15.26)	51 (42.63)	51 (42.11)
Send and receive mail	17 (14.21)	35 (28.95)	68 (56.84)
Download songs and videos or ringtones	13 (10.53)	47 (39.47)	60 (50.00)
Get News or weather online	16 (12.63)	23 (19.37)	81 (67.89)
Face book , whatsApp	51 (42.63)	21 (17.36)	40 (48.21)

The findings regarding extent of utilization of radio are present in Table 4.27. As regard to a listening news, 75.72 per cent of students by never utilize, followed by rarely utilize (14.14%) and regular utilize (7.14%). Regarding youth programmes, 82.86 per cent of students never utilize, followed by rarely utilize (14.28%) and regular utilize (2.86%). Regarding entertainment, 55.51 per cent of students rarely utilize, followed by 30 per cent of students regular utilize. Regarding employment news, 97.14 per cent of students never utilize, followed by rarely utilize (2.86%). Regarding agricultural programmes, 98.57 per cent of students never utilize, followed by rarely utilize (1.43%).

The findings regarding extent of utilization of mobile are also present in Table 4.27. As regard to send and receive text message/MMs, 53.16 per cent of students rarely utilize, followed by regular utilize (31.58%) and never utilize (15.26%). Regarding play games, 36.84 per cent students rarely utilize, followed by regular utilize (32.11%) and never utilize (31.05%). Regarding take picture, 53.16 per cent students rarely utilize, followed by never utilize (28.42%) and regular utilize (18.42%). Regarding play music or MP3 films, 47.37 per cent students regular utilize, followed by rarely utilize (32.11%) and never utilize (20.52%). Regarding play video, 48.42 per cent students rarely utilize, followed by never utilize (35.79%) and regular utilize (15.79%). Regarding record video, 55.79 per cent students never utilize, followed by rarely utilize (38.95%) and regular utilize (5.26%). Regarding access the internet or web sites, 42.63 per cent students rarely utilize, followed by never utilize (42.11%) and regular utilize (15.26%). Regarding send and receive mail, 56.84 percent students never utilize, followed by rarely utilize (28.95%) and regular utilize (14.21%). Regarding download songs and video or ring tones, 50 per cent students never utilize, followed by rarely utilize (39.47%) and regular utilize (10.53%). Regarding get news or weather online, 67.89 per cent students never utilize, followed by rarely utilize (19.37%) and regular utilize (12.63%). Regarding face book and whatsapp, 42.63 per cent students regular utilize, followed by rarely utilize (17.36%) and never utilize (24.21%).

Table 4.28. Distribution of respondents according to extent of utilization of selected ICT tools

ICT tools	Frequency	Percentage
Internet (n=120)		
Low (0 to 4 scores)	35	28.95
Medium (5-9 scores)	59	49.47
High (above 9 scores)	26	21.58
Television (n=112)		
Low (0 to 4 scores)	22	19.21
Medium (5-9 scores)	80	71.75
High (above 9 scores)	10	9.04
Radio (n=44)		
Low (0 to 3 scores)	32	72.86
Medium (4-6 scores)	08	18.57
High (above 6 scores)	04	08.57
Mobile (n=120)		
Low (0 to 7 scores)	08	06.84
Medium(8-14 scores)	27	22.63
High (above 14 scores)	85	70.53

Table 4.28 and Fig 4.7 represents the data on distribution of respondents according to extent of utilization of ICT tools. Regarding extent of utilization of Internet, 49.47 per cent students had medium extent of utilization, followed by 28.95 per cent students had low extent of utilization and 21.58 per cent students had high extent of utilization. As regards to extent of utilization of television, 71.75 per cent of the students had medium extent of utilization, followed by 19.21 per cent students had low extent of utilization and 9.04 per cent students were having high extent of utilization. Regarding extent of utilization of Radio, 72.86 per cent students had low extent of utilization, followed by 18.587 per cent of students were medium extent of utilization and 8.57 per cent students were having high extent of

utilization. Regarding extent of utilization of mobile, 70.53 per cent of students were high extent of utilization, followed by 22.63 per cent of students had medium extent of utilization and 6.84 per cent of students had low extent of utilization.

Table 4.29. Distribution of respondents according to their overall extent of utilization of selected ICT tools

ICT tools	Frequency	Percentage
Low (0 to 20 scores)	36	30.00
Medium (21-40 score)	51	42.10
High (Above 40 scores)	33	27.90
Total	120	100.00

Table 4.29 and Fig 4.8 represent the data on distribution of respondent according to overall extent of utilization of ICT tools. The finding shows that the maximum number of students (42.10%) had medium level of extent of utilization, followed by 30 per cent of students were low level of extent of utilization and 27.90 per cent of students were having high level of extent of utilization.

It can be concluded to majority having 70.00 per cent over all extent of utilization of selected ICT tools were medium to high.

Correlation coefficient of independent variables with Extent of Utilization of information and communication technology

To determine the correlation and regression analysis of selected independent variables with extent of utilization of information and communication technology, the analysis was done and results are presented in Table 4.30 and 4.31.

Table 4.30. Association between independent and dependent variable of Extent of Utilization of information and communication technology

S.N.	Independent variable	Coefficient of correlation
		“r” value
X1	Sex	0.6687**
X2	Caste	-0.0056
X3	Language school education	-0.1556*
X4	Subject of 10+2	0.1365
X5	Family background	0.7828**
X6	Parents education	-0.1018
X7	Knowledge about ICT tools	0.5320*
X8	Accessibility of ICT tools	-0.0432
X9	Monthly expenditure pattern	0.8490**
X10	Family occupation	-0.1349
X11	Family annual income	0.7423**
X12	Source of awareness	0.0188
X13	Time spend purpose	-0.0283
X14	Perception about various ICTs	0.0184
X15	Attitude towards ICTs	0.0129

***Significant at 0.05 level of probability**

****Significant at 0.01 level of probability**

Table 4.30 shows the relationship between independent and dependent variables that Out of 15 independent variables, only 6 variables i.e. sex, language in school education, family background, knowledge about ICTs tools, monthly expenditure pattern and family annual income were found to be significantly correlated with extent of utilization of information and communication technology by the respondents. Out of these significant variables, the variables family sex, monthly expenditure pattern and family annual income were found positive and highly significantly correlated at 0.01 level of significance variable language in school education and knowledge about ICT tools, was also found positive and significantly correlated at 0.05 level of probability. The other variables like caste, subject of 10+2, parents education, accessibility of selected ICT tools, family occupation, source of awareness, perception about various ICTs, attitude towards ICTs and showed statistically non significant relationship with extent of utilization of information and communication technology.

In the case of multiple regression analysis, out of selected 15 independent variables only 4 variables i.e. sex, language in school education, monthly expenditure pattern and family annual income showed the positive and significant contribution with extent of utilization of information and communication technology. Remaining 11 variables did not contribute significantly in extent of utilization of information and communication technology. However, all the selected 15 independent variable in the model show 61.42 per cent contribution in extent of utilization of information and communication technology (Table 4.31) Therefore, it can be concluded that higher family income, higher expenditure pattern, English medium in school education and urban family back ground were the key factors for higher utilization of information and communication technology among the students. Hence, focus should be given to above predictors to consider in planning for increasing the use of ICTs among the post graduate students.

Table 4.31. Multiple regression analysis of independent variables with the extent of utilization of information and communication technology

S.N.	Independent variables	Regression Coefficient “b” value	“t” Value
X1	Sex	0.3860**	2.5152
X2	Caste	0.0180	0.2866
X3	Language in school education	0.2194	-1.7736
X4	Subject of 10+2	0.1225*	2.2425
X5	Family background	0.0103	0.1173
X6	Parents education	-0.0607	-1.1906
X7	Knowledge about ICT tools	0.1574	1.4240
X8	Accessibility of selected ICT tools	0.0438	0.4249
X9	Monthly expenditure pattern	0.0616**	3.0261
X10	Family occupation	-0.0528	-1.0477
X11	Family annual income	0.1621*	2.8533
X12	Sources of awareness	0.0001	0.0018
X13	Time spend purpose	0.0413	0.4926
X14	Perception about various ICTs	0.0902	0.6614
X15	Attitude towards ICTs	-0.0491	-0.3153

*Significant at 0.05 level of probability

**Significant at 0.01 level of probability

Multiple R² = 0.6142

F value= 1.8906

4.4 Constraints faced by the respondents in utilization of information and communication technology

The data regarding constraints faced by the respondent in utilization of information and communication technology are presented in Table 4.32. The data reveals that the 49.48 per cent of the students faced sometime regarding monetary problem, followed by 26.84 per cent of them were never faced and 23.68 per cent of them facing always this problem. Regarding inadequate internet facility, 60 per cent respondents never faced, followed by 32.11 per cent of them sometime faced and 7.89 per cent of them always faced this problem. Regarding read only content, 45.26 per cent respondents faced sometimes, followed by 33.68 per cent of them never faced and 21.06 per cent respondents always faced this problem. Regarding cannot download full article, 47.37 per cent respondents faced sometimes followed by 30.53 per cent respondent always faced and 22.10 per cent respondents never faced this problem. Regarding Internet connection is poor/ low, 60 per cent of the respondents faced always, followed by 34.74 per cent respondents faced sometimes and 5.26 per cent respondents never faced this problem. Regarding Sometime article available only in abstract, 44.21 per cent respondents always faced, followed by 33.68 per cent respondents Sometime faced and 22.11 per of respondents never faced this problem. Regarding difficulties in find out the free and paid online service, 39.48 per cent faced sometime, followed by 32.63 per cent respondents never faced and 27.89 per cent respondents always faced this problem. Regarding low network on mobile phones, 47.89 per cent respondents sometime faced followed by 43.16 of respondents always faced and 8.95 per cent respondent never faced this problem.

Regarding problem in setting the frequency of radio channel, 63.16 per cent respondent never faced followed by 28.42 per cent respondent sometime faced, and 8.42 per cent respondents always faced this problem. Regarding unwanted service activate in mobile, 52.63 per cent respondents never faced, followed by 37.79 per cent respondent sometime faced and 11.58 per cent respondents always faced this problem. Regarding Continue work on internet causing Eye pain, Back pain, Headache and Hand pain,

61.05 per cent respondents always faced, followed by 25.26 per cent never faced and 13.68 per cent always faced this problem. Parida (2010) also noted almost similar findings.

Table 4.32. Distribution of respondents according to constraints faced by them in use of ICT tools

Constraints	Always	Some times	Never
Monetary problem	28 (23.68)	59 (49.48)	33 (26.84)
Inadequate internet facilities	09 (07.89)	39 (32.11)	72 (60.00)
Read only content	25 (21.06)	54 (45.26)	40 (33.68)
Cannot download full article	37 (30.53)	57 (47.37)	27 (22.10)
Internet connection is poor	72 (60.00)	42 (34.74)	06 (05.74)
Sometime article available only in abstract form	40 (33.68)	53 (44.21)	27 (22.11)
Difficulties in find out the free and paid online service	34 (27.89)	47 (39.48)	39 (32.63)
Low network on mobile phone	52 (43.16)	57 (47.89)	11 (08.95)
Problem in setting frequency of radio channel	10 (08.42)	34 (28.42)	76 (63.16)
Unwanted service activate in mobile	14 (11.58)	43 (35.79)	63 (52.63)
Continuous work on internet causing Eye pain, back pain, headache and head pain	16 (13.68)	74 (61.05)	30 (25.26)

4.5 Suggestions for effective utilization of information and communication technology for effective utilization

This part depicts different suggestions mentioned by the respondents for effective utilization of ICT tools. The data reveal that majority of the respondents (63.33%) suggested that the speed of internet should be improved, followed by 59.16 per cent of respondents suggested that network of internet, mobile and radio channels should be strong, 58.33 per cent of

respondents suggested that internet voucher price and recharge rate should be low/less, 46.66 per cent of respondents suggested that full length research paper should be downloaded from internet 39.16 per cent of respondents suggested that separate job channel should be available, 24.16 per cent of respondents suggested that online journal got from internet, 22.05 percent of respondents suggested that customer service should be good, 19.16 percent of respondents suggested that T.V. programme should be organized from every field people / all people (student, farmer, housewife etc.) and 12.50 per cent of respondents suggested that subsidized rates for internet / mobile recharge should be available for students.

Table 4.33. Suggestions perceived by respondents for effective utilization of information and communication technology

Suggestion	Frequency	Percentage
Speed of internet should be improve	76	63.33
Network of internet, mobile and radio channels should be strong	71	59.16
Internet voucher price and recharge rate should be low / less	70	58.33
Full length research paper should be downloaded from internet	56	46.66
Separate job channel should be available	47	39.16
Online journal got from internet	29	24.16
Customer service should be good	27	22.05
T.V. programme should be organized from every Field people/ all people (student, farmer, housewife)	23	19.16
Subsidized rates for internet / mobile recharge should be available for students	15	12.50

DISCUSSION

The main purpose of this chapter is to summarize the results to state the conclusion on the basis of analysis and to indicate some of their implications for action. The study entitled “**Utilization Pattern of ICTs by the agriculture PG students of College of Agriculture, JNKVV Jabalpur (M.P.)**” was carried out during 2016-17 with the following specific objectives:

1. To study the profile of Agriculture post graduate students
2. To study the utilization pattern of ICTs by the agriculture post graduate students
3. To study the perception of students about ICTs
4. To obtain the constraints about use of ICTs and their suggestions for effective utilization

The present study was conducted in the College of Agriculture Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur. There were around 394 students studying in Post Graduate courses during the academic session 2016-1017. Out of them, 120 students were selected randomly for this study. In this way total 120 (60+60) post graduate students were considered as respondents for the present study. In this study, only four ICT tools viz. Internet, Television, Radio, and Mobile phone were considered. For the study, data were collected through personal interview technique with the help of structured and pre tested interview schedule and analyzed with appropriate statistical methods. The major findings of the study are summarized as follows.

The independent variables included in the study were (Sex, Caste, Language in school education, Subject of 10+2, Family background, Parents education, knowledge about ICT tools Accessibility of selected ICT tools, Monthly expenditure pattern, Family Occupation, family annual income, sources of awareness, Time spend purpose Perception of agricultural post graduate students about various ICTs, Attitude of agricultural post graduate students towards ICTs) Extent of Utilization of information and

communication technology by the respondents was considered as dependent variable for this study. The data were analyzed with appropriate statistical methods.

The major findings of the study are summarized as follows
Independent variables

Socio-personal characteristics sex of the respondents indicated that the students were male 65.00% and 35.00% female students. Raji and Godsy (2010) also reported almost similar findings.

About 31 per cent respondents belonged to other backward caste, followed by 27.89 per cent belonged to scheduled tribe.

Majority of the respondent's language in school education (67.89%) Hindi medium followed by 28.42 per cent of the respondents studied in English medium. Majority of the respondents subject in (10+2) is (53.68%) had biology as major subject.

The data regarding major subject of 10+2 is indicate that majority of the respondents (49.16%) had biology as major subject, followed by agriculture subject (28.33%) and (22.50%) per cent of respondents had mathematics in their higher secondary education. The finding was supported by Patidar (2002).

It was observed that fifty per cent of the respondent's family (50%) resides in the villages and belonged to the educated families. It is clear that service class and agriculturist class students are dominating in the agricultural education. The finding Patidar (2002) support similar findings.

Regarding parents education of respondents 37.37 per cent of fathers education has under graduate education and mothers are 37.50% up to middle school of education.

Knowledge about ICTs tools 51.66% in medium category followed by 37.05% in higher and 10.53% in low level of knowledge about ICT tools. Suggested by Mishra (2008).

Data regarding accessibility of selected ICT tools are presented result reveal that cent per cent student had mobile phone, followed by 95.26 percent student had internet connectivity, 94.21 per cent students had access to television, 83.68 per cent students had laptop, 64.21 per cent students had radio and only 9.47 per cent students had desktop computer.

About fifty per cent of the respondents made monthly expenditure (excluding fees) in the range between Rs.3001-4000, of which maximum share was on regular food and hotling. It was supported by Finch et al. (2006).

In respect of socio-economical characteristics, more than half of the respondents were belonging to family of Govt. service. About 31.05 per cent of respondents were having their annual family income in the range of Rs. 3,0,001 – 4,00,000 followed by 23.68 per cent of respondents had their annual income in the range between Rs. 1,00,001 – 2,00,000, while 22.63 per cent of the respondents had obtained family income in the range between Rs. 2,00,001 – 3,00,000 and only 8.95 per cent of respondents belonged to very high income family with above Rs. 4,00,000. Patidar (2002) and Sharma and Hasan (2012) also noted almost similar findings.

Regarding communicational characteristics, majority of the respondents (75.26%) were getting information about ICT tools from friends and relative. Cent per cent were aware with mobile internet. Regarding use of selected ICT tools, students were regularly using Mobile, followed by Internet, television and radio. Almost similar result was reported by Parida (2010).

Regarding time spend purpose in ICTs, majority of respondents (39.16%) were for research purpose. It was also finding by zakaria, Watson & Edwards (2010).

Regarding the socio – psychological characteristics, majority of respondents (63.16%) had favorable perception about ICTs and 33.16 per cent respondents had highly favorable perception about ICTs. Rajput et al.

(2010) also noted almost similar findings. Majority of respondents (86.84%) had more favorable attitude towards ICTs. Raksha et al. (2012) also found almost similar findings.

Majority of the students (67.23%) were watching Zee Chhattisgarh and ABP news channels, regarding to entertainment channels, Set max, Channel V, Star Gold were popular. Majority of the students (79.09%) utilizing information after watching television by retaining it into the memory. Bisht et al. (2007) and Mishra et al. (2011).

Regarding radio, 97.14 per cent of the students listened radio for entertainment only but regular radio listeners were very less. About 59 per cent of the students spent up to 30 minutes time per day mostly for listing songs on the radio. Mishra et al. (2011) also noted similar finding.

Regarding mobile phone, majority (94.74%) of the students were using mobile phones for getting contacts with friends, batch mates and colleagues, as compared to 88.94 per cent students using mobile phone for contact with parents. Majority (57.36%) of students used internet on mobile phone for downloading songs and videos or ring tones, followed by 51.57 per cent used it for facebook and whatsapp.

Dependent variable

Regarding the extent of utilization of ICT tools, selected ICT tools, 49.47 per cent students had medium utilization of internet, television 71.75 per cent. About 72.86 per cent students had low extent of utilization of radio and 70.53 per cent students had high extent of utilization of mobile phones. Regarding overall utilization, 42.10 per cent of students were found in medium level of utilization, followed by 30.00 per cent students were in low level of utilization and 27.90 per cent students were found in high level of utilization of ICT tools.

Correlation coefficient and multiple regression analysis

Regarding correlation coefficient, out of 15 independent variables, only 6 variables i.e. sex, language in school education, family background, knowledge about ICT tools, monthly expenditure pattern and family annual income were found to be significantly correlated with extent of utilization of information and communication technology by the respondents. As regards to multiple regression analysis, out of selected 15 independent variables, only 4 variables i.e. sex, subject (10+2), monthly expenditure pattern and family annual income showed the significant contribution to the extent of utilization of information and communication technology .

Constraints faced by the respondents in utilization of information and Communication technology

The data regarding constraints faced by the respondents in utilization of information and communication indicated that, 49.48 per cent of the students faced sometime regarding monetary problem, followed by 26.84 per cent of them were never faced and 23.68 per cent of them were having always faced this problem. Regarding inadequate internet facility, 60 per cent respondents never faced, followed by 32.11 per cent of them sometime faced and 7.89 per cent of them always faced this problem. Regarding read only content, 45.26 per cent respondents faced sometimes, followed by 33.68 per cent of them never faced and 21.06 per cent respondents always faced this problem. Regarding can not download full article, 47.37 per cent respondents faced sometimes followed by 30.53 per cent respondents always faced and 22.10 per cent respondents never faced this problem. Regarding Internet connection is poor/ low, 60 per cent of the respondents faced always, followed by 34.74 per cent respondents faced sometimes and 5.26 per cent respondents never faced this problem. Regarding Sometime article available only in abstract, 44.21 per cent respondents always faced, followed by 33.68 per cent respondents sometime faced and 22.11 per of respondents never faced this problem. Regarding difficulties in find out the free and paid online service, 39.48 per cent faced sometime, followed by 32.63 per cent respondents never faced and 27.89 per cent respondents always faced this problem. Regarding low network on mobile phones, 47.89

per cent respondents sometime faced followed by 43.16 of respondents always faced and 8.95 per cent respondents never faced this problem. Regarding problem in setting the frequency of radio channel, 63.16 per cent respondents never faced followed by 28.42 per cent respondents sometime faced, and 8.42 per cent respondents always faced this problem. Regarding unwanted service activate in mobile, 52.63 per cent respondents never faced, followed by 37.79 per cent respondents sometime faced and 11.58 per cent respondents always faced this problem. Regarding Continue work on internet causing Eye pain, Back pain, Headache and Hand pain, 61.05 per cent respondents always faced, followed by 25.26 per cent never faced and 13.68 per cent always faced this problem.

Suggestions for effective utilization of information and communication technology

This part depicts different suggestions mentioned by the respondents for effective utilization of ICT tools and the finding are presented in Table 4.23. The data reveals that the majority of the respondents (63.33%) suggested that the speed of internet should be improved, followed by 58.33 per cent of respondents suggested that network of internet, mobile and radio channels should be strong, 59.16 per cent of respondents suggested that internet voucher price and recharge rate should be low/less, 46.66 per cent of respondents suggested that full length research paper should be downloaded from internet, 39.16 per cent of respondents suggested that separate job channel should be available, 24.16 per cent of respondents suggested that online journal got from internet, 22.05 per cent of respondents suggested that customer service should be good, 19.16 per cent of respondents suggested that T.V. programme should be organized from every field people / all people (student, farmer, housewife etc.) and 12.50 per cent of respondents suggested that subsidized rates for internet / mobile recharge should be available for students.

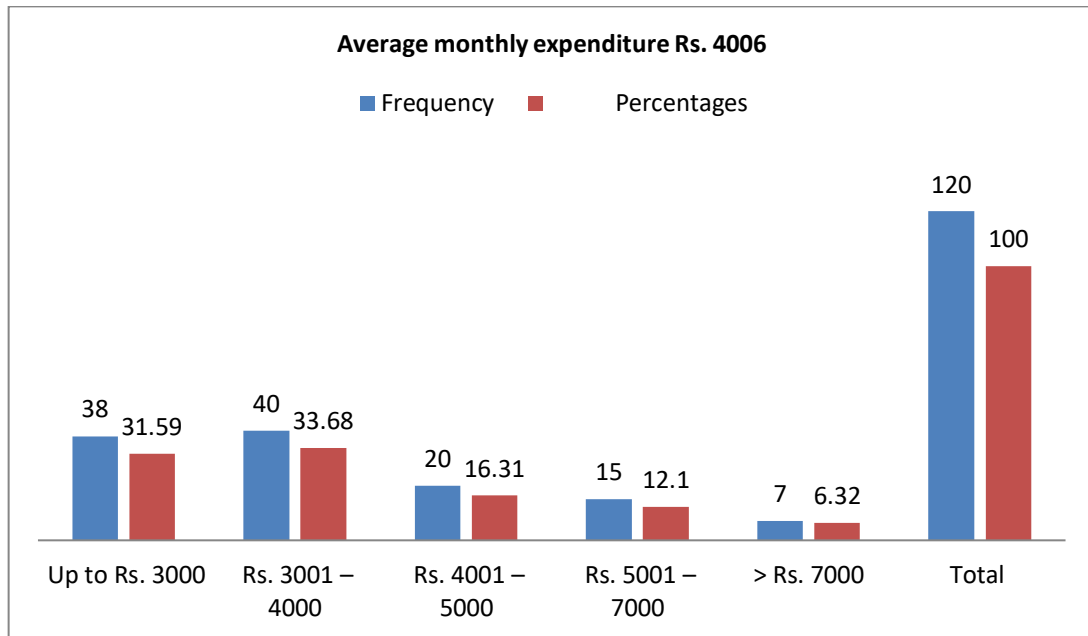


Fig. 4.1 **Distribution of respondents according to monthly expenditure excluding fees**

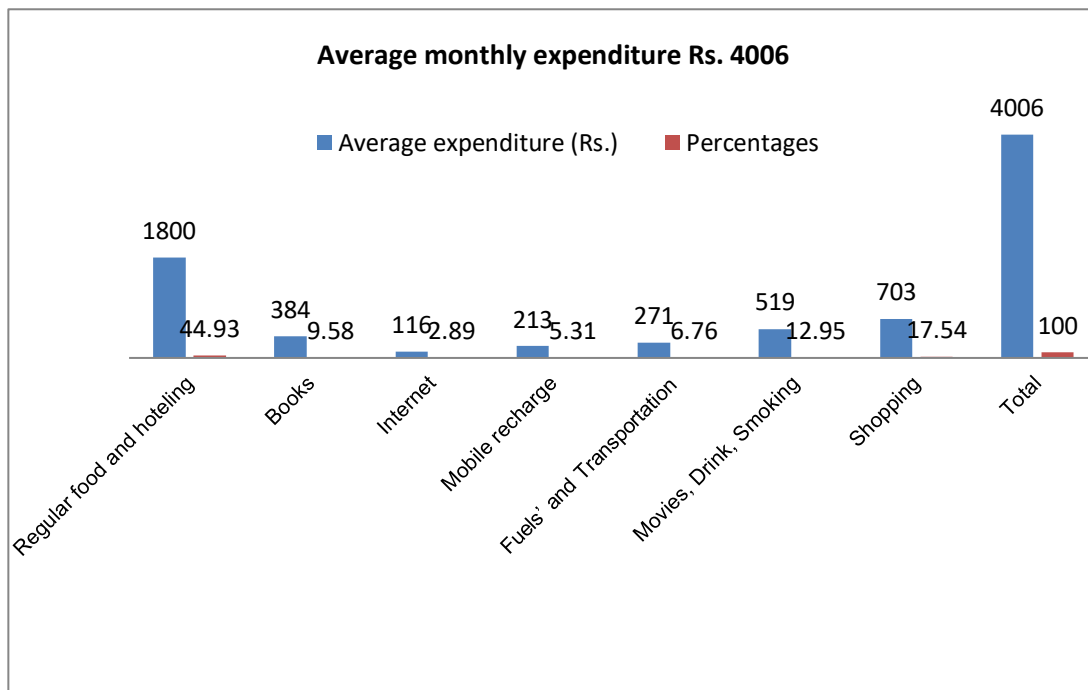


Fig. 4.2 **Monthly expenditure pattern of student**

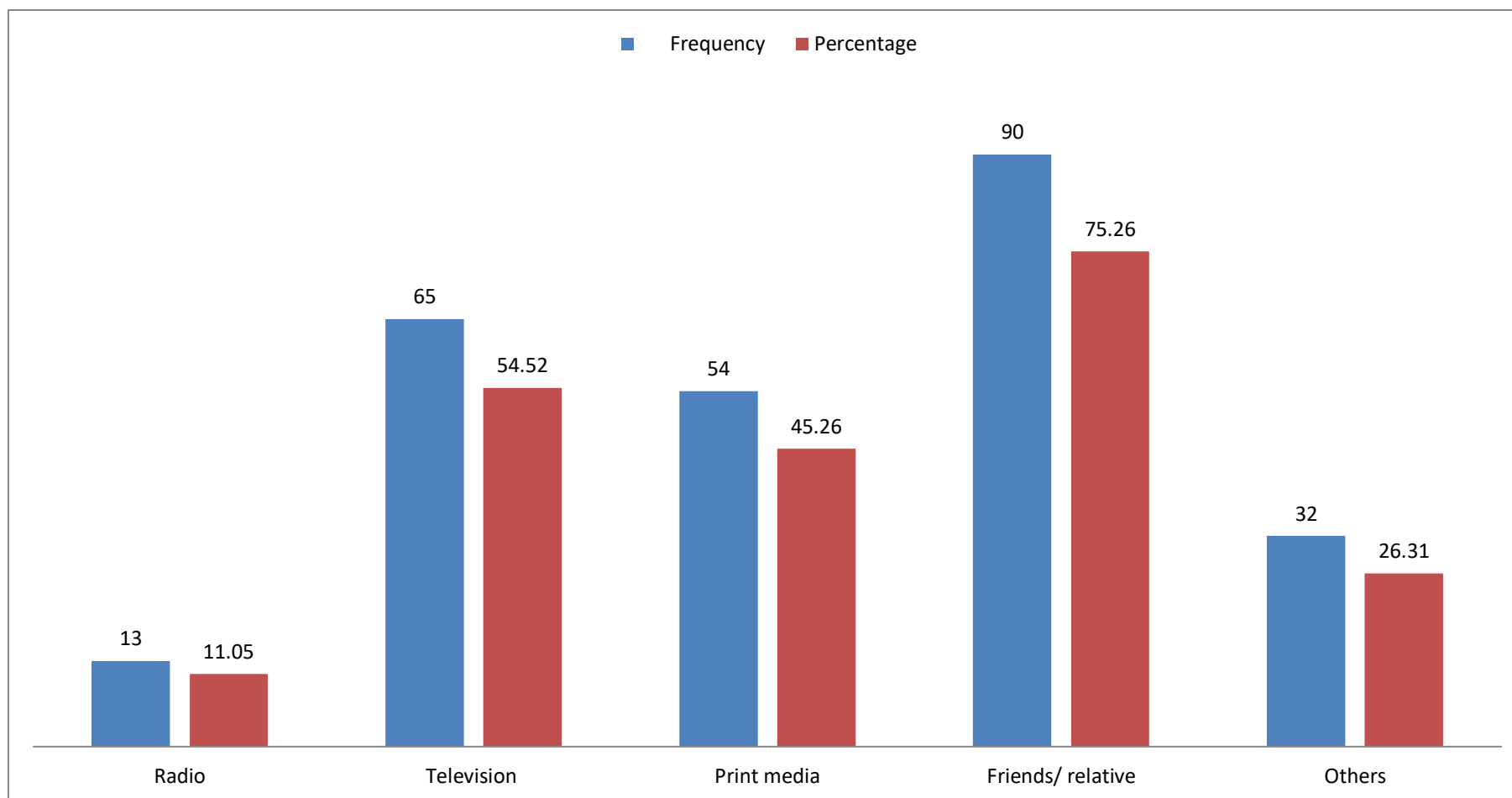


Fig. 4.3 **Distribution of respondents according to source of awareness about ICT tools**

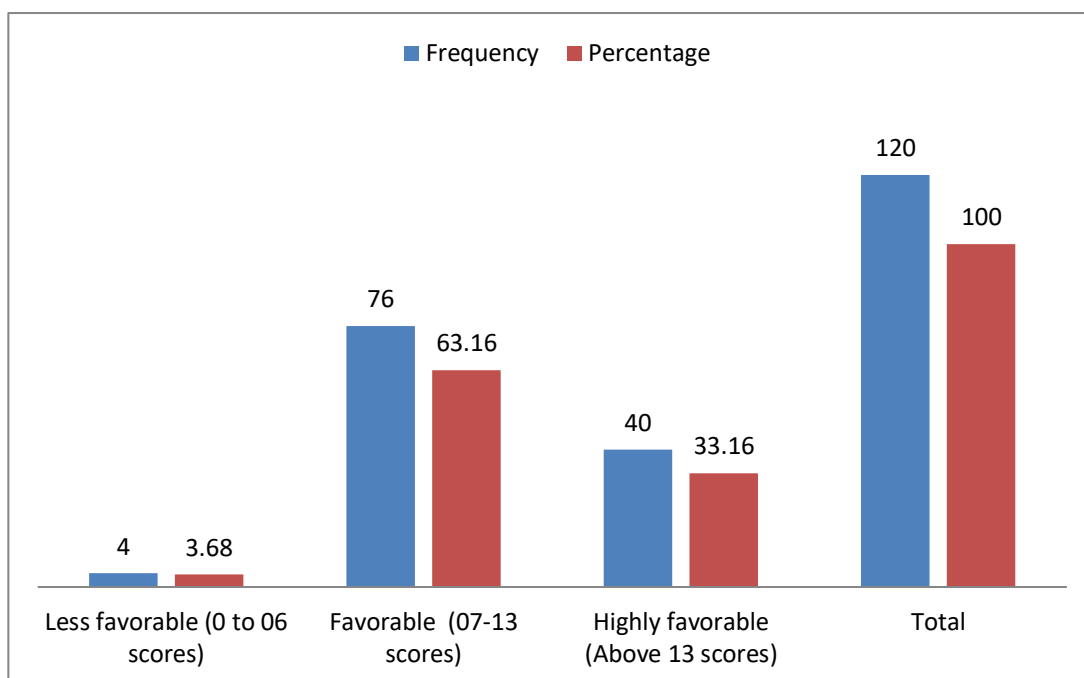


Fig. 4.4. Distribution of respondents according to perception about ICTs

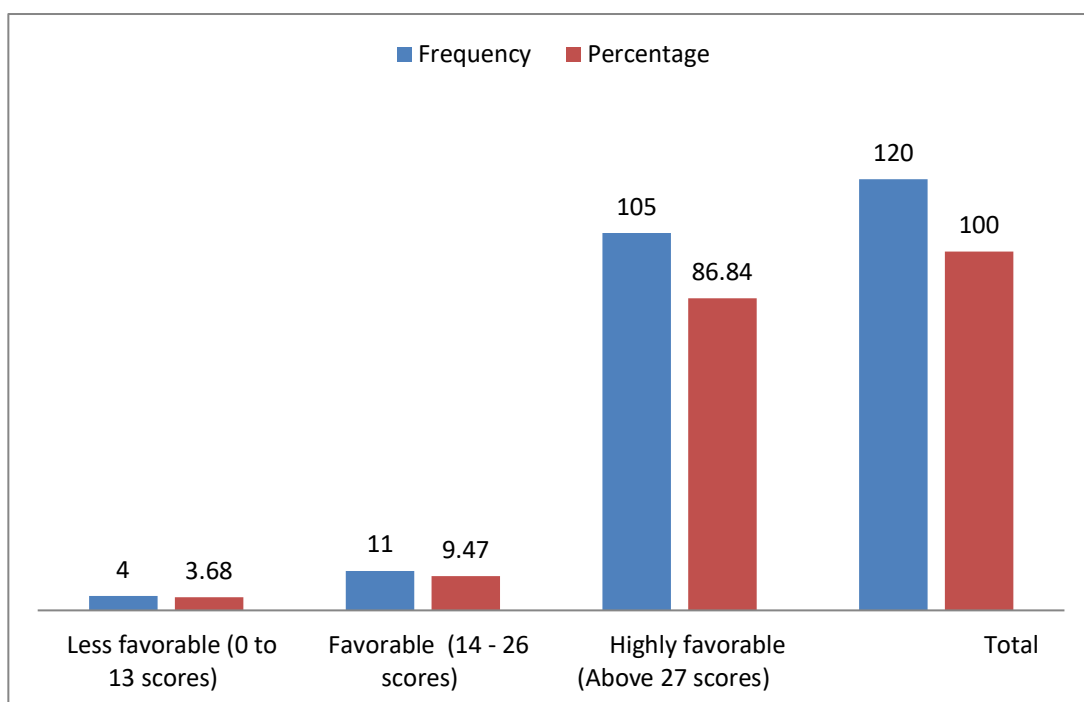


Fig. 4.5. Distribution of respondents according to their attitude towards ICTs

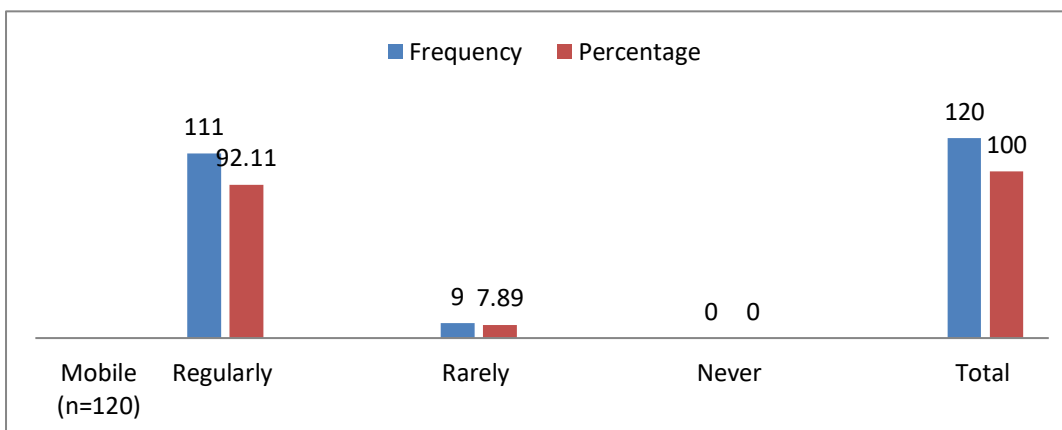
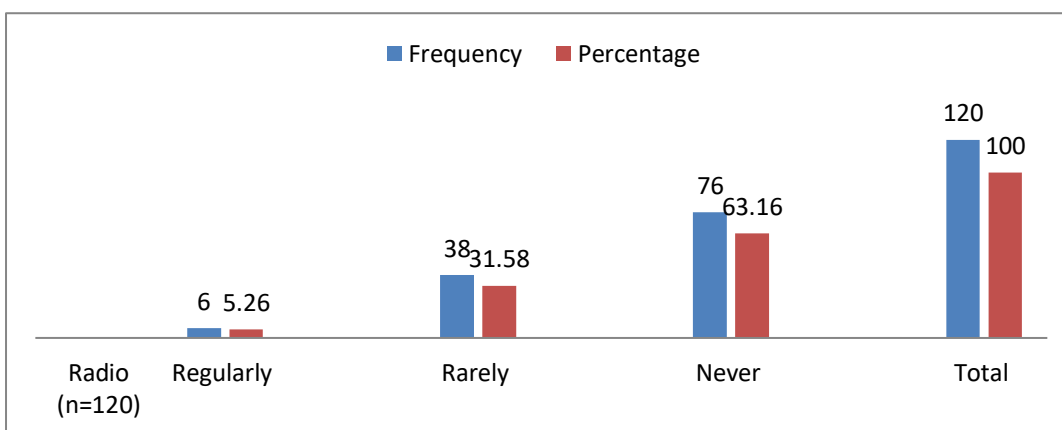
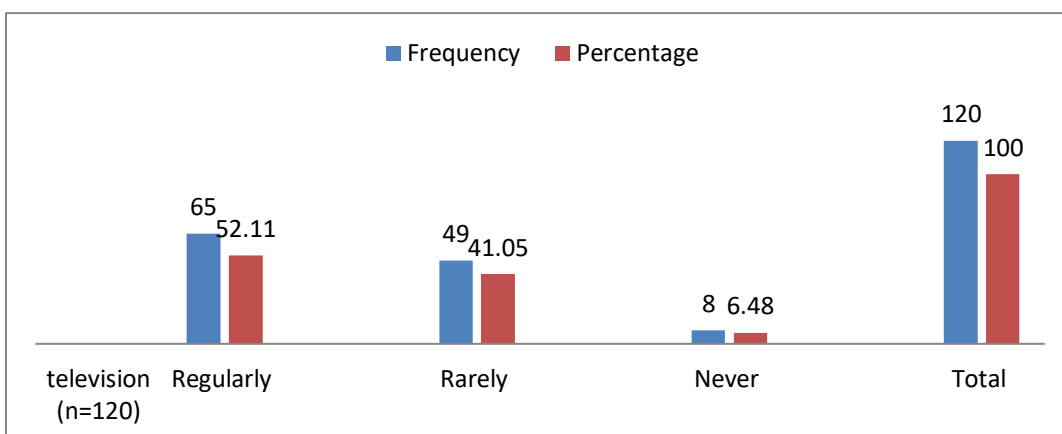
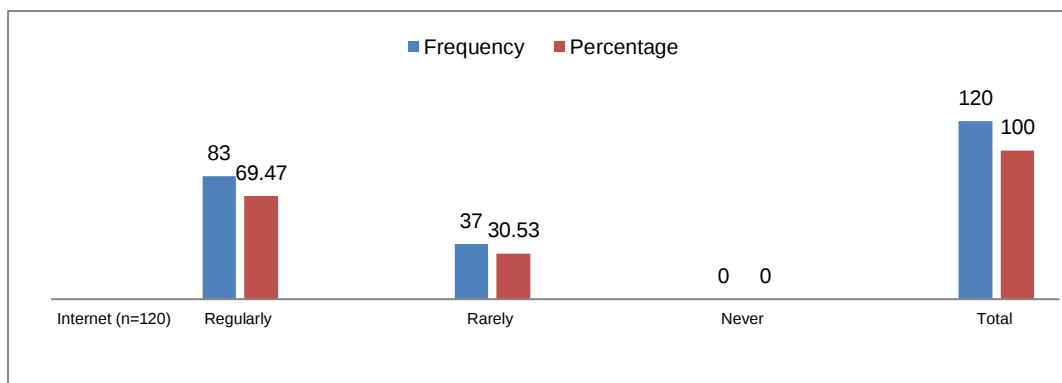


Fig. 4.6. Utilization of selected ICT tools

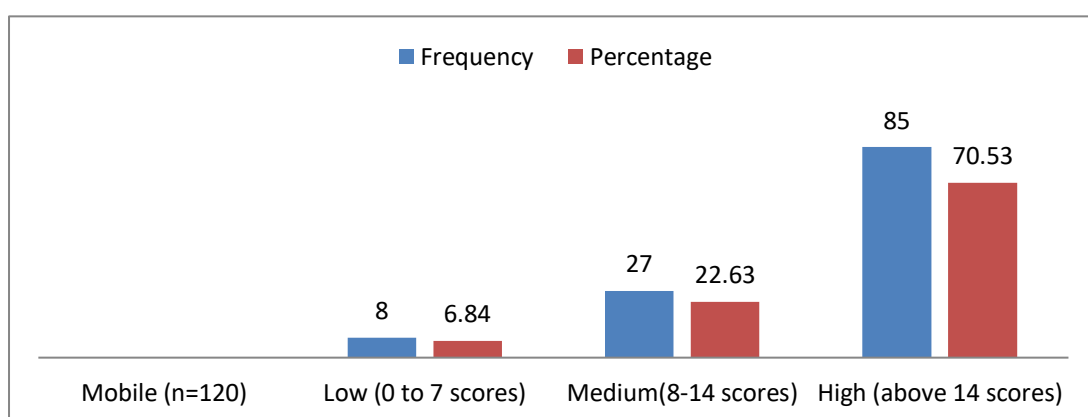
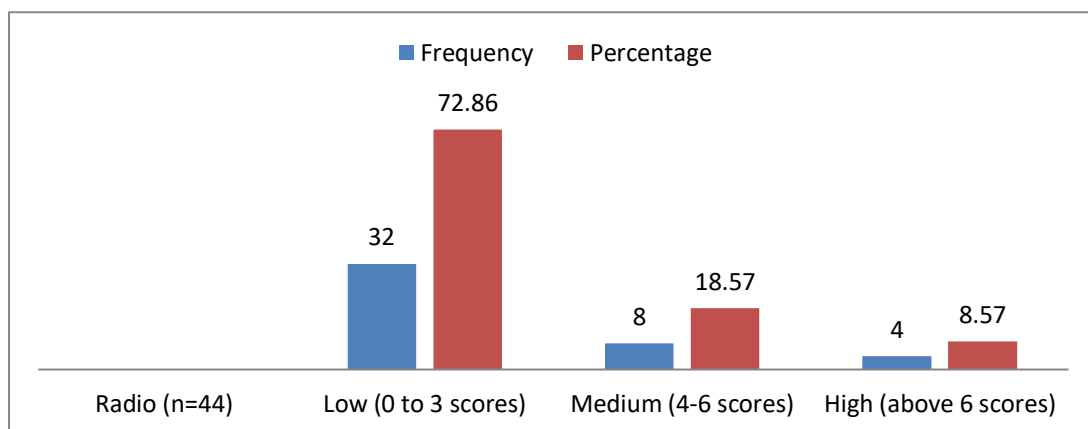
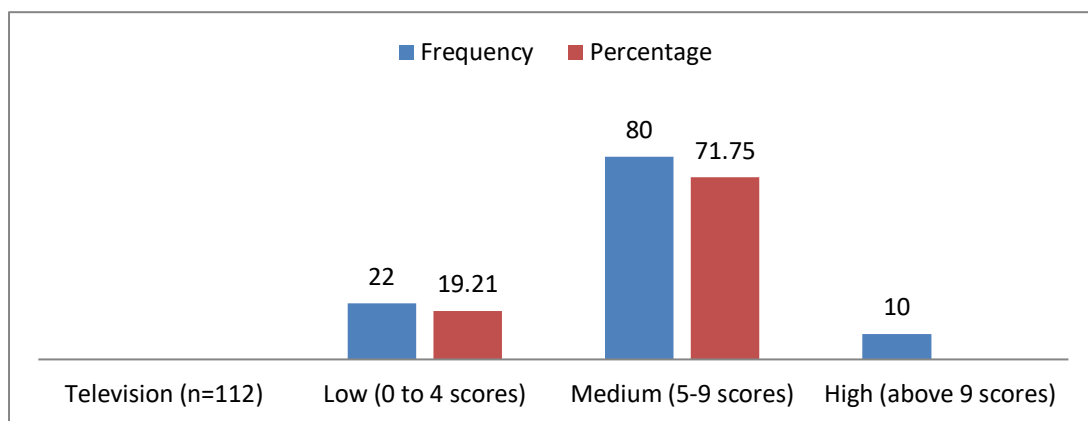
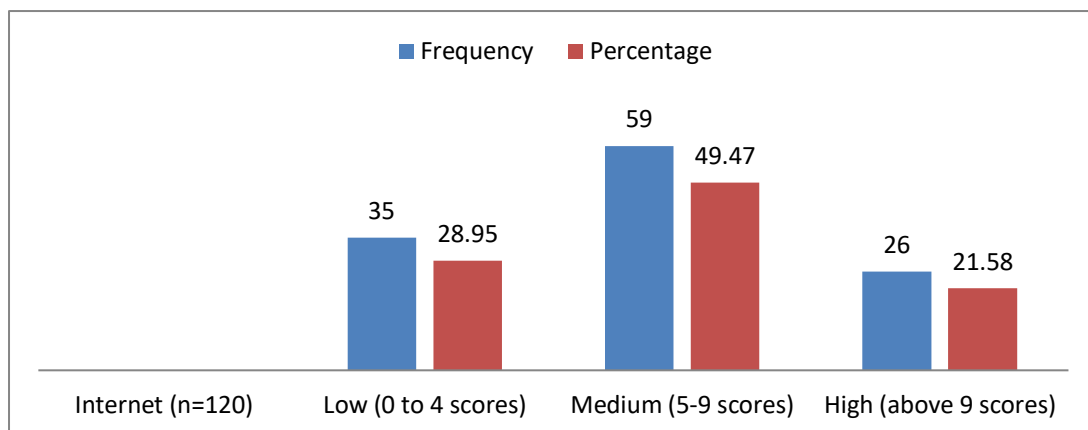


Fig. 4.7. Extent of utilization of selected ICT tools

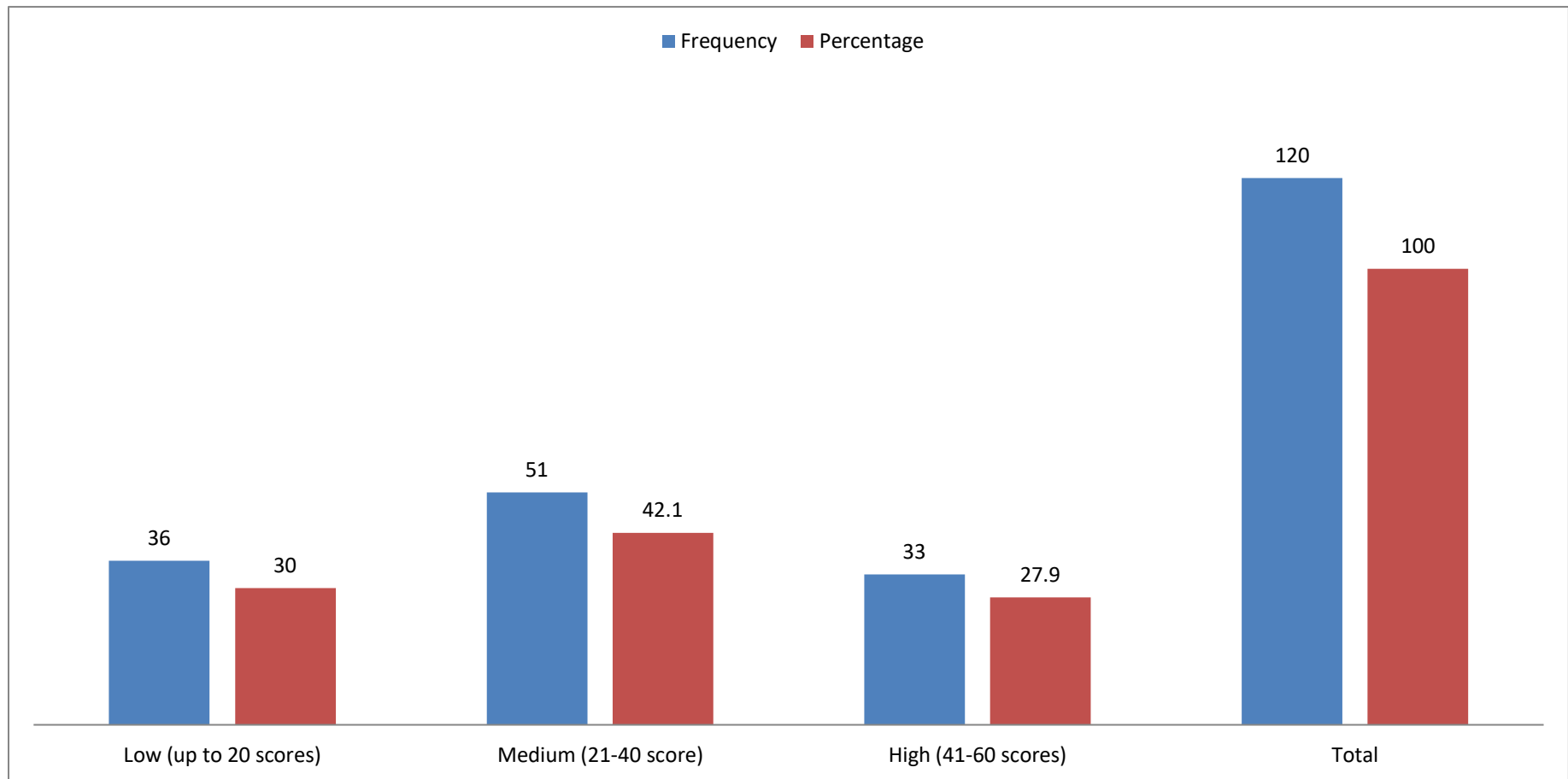


Fig. 4.8. Overall extent of utilization of selected ICT tools

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JAWAHARLAL NEHRU KRISHI VISHWAVIDYALAYA

COLLEGE OF AGRICULTURE JABALPUR (MP)

DEPARTMENT OF EXTENSION EDUCATION

Interview schedule

Utilization pattern of ICT's by the agriculture PG students of college of agriculture , JNKVV Jabalpur (M.P.)

Major advisor

Dr. V.K. Pyasi

Professor

Dept. of extension education

Researcher

Prince Thakur

M.sc Ag

Dept. of extension education

Research year 2016-17

Part – A

Q.1. Information about student:

1. Name: 2. Date of birth:
3. Sex: 4. Studying class:
5. Caste:
6. Language in school education: (1). Hindi, (2). English, (3). Others
7. Subject of 10+2: (1). Maths, (2). Bio, (3). Agri.

8. Accessibility to ICT Tools: Given the following information about the availability of ICT tools

S. No.	Tools	Accessibility	Yes/No
1.	Desktop		
2.	Laptop		
3.	Internet		
4.	Television		
5.	Mobile		
6.	Radio		

9. How much amount of money you spend monthly:Rs

10. Please give your monthly expenditure pattern on the following heads:

S.No.	Particular	Amount (Rs.)
1.	Regular Food hoteling	
2.	Books	
3.	Internet	
4.	Mobile recharge	
6.	Fuels (petrol etc.)	
8.	Movies drink and smoking	
7.	Shopping	
8.	Other	

Q.2. Please provide the following information about family:

1. Parental residential background: Village/Town/City.....
2. Education of Parents: Father's..... Mother's.....
3. Occupation of family: 1.Govt. Service, 2. Private Service,
3. Business, 4. Agriculture,
5. Other (specify).....
4. Family annual income: (Rs.).....

PART-“B”

Q.3. Up to what extent you are agree about the following statements regarding information and communication technology (ICT) –

S.No..	Statement	Full Agree	Partial agree	Not agree
1.	I am comfortable using ICT			
2.	ICT help in improving my performance			
3.	ICT is a barrier in social communication			
4.	ICT skills add value to student's personality			
5.	ICT is a burden rather than aid for learning			
6.	ICTs are helpful in e-learning			
7.	ICT demands higher level of computer literacy			
8.	ICTs help students in preparation of assignment			
9.	I prefer to use e-mail for communication			
10.	I prefer to use mobile/telephone/SMS for communication rather than face to face			

Q.4. Attitude of students towards ICT: Please give your opinion (Level of agreement) about the following statements regarding ICTs

S.No	Statement	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1.	ICTs provide self placed learning					
2.	ICTs use needs constant updating of learning materials					
3.	Using ICTs speed up reading and learning kills					
4.	The time saved by use of ICTs can be better used for other productive works					
5.	ICTs will broaden the knowledge horizons of individuals					
6.	Use of ICTs in the classroom teaching makes interesting					
7.	Downloading 3-D diagrams, pictures related to subject makes subject more clearly than traditional classroom teaching.					
8.	Preparation of ematerials is a time consuming activity					
9.	Maintaining ICTs equipments is necessary for successful running or using ICTs					
10.	It enables learning at any convenient time and place					

Q.5. Awareness of student about ICT tools:

1. Are you aware of ICT tools? Yes/No: If yes them
2. How do you come to know about ICT tools? (Internet, Television, Radio, Mobile)

S. No.	Source of Information	Yes / No
1.	Radio	
2.	Television	
3.	Print media	
4.	Friend/ Relative	
5.	Mobile	

Q.6: Please give the following information about use of ICT tools

ICT tools	Regular	Rarely	Never
Internet			
Television			
Radio			
Mobile			

Q.7. Time spend type or purpose

Purpose	Yas/No	Rank
Research		
Teaching		
Learning		
Entertainment		
Other		

Q.8. Knowledge about ICT tools (how to use)

ICT tools	Full	Partial	Never
Phone calling			
Internet browsing			
e-mail			
Chat			
Media			

PART- “C”

Internet: Are you regular user of internet – Yes / No

1. If yes; then what is the Purpose of using internet? Please assign the rank about the following purpose on the basis of your use

S.No.	Purpose	Yes/ No	Rank	S.No.	Purpose	Yes/ No	Rank
1.	News			2.	Entertainment		
3.	Job search			4.	Information		
5.	Games			6.	Academic purpose		
7.	e-mail			8.	Chatting		
9.	For buying tickets			10.	For shopping		

2. What are the sites mostly visited? Please assign the rank on the basis your preference

S.No.	Sites	Yes/ No	Rank	S.No.	Sites	Yes /No	Rank
1.	Google			2.	ICAR		
3.	Rediff			4.	Others		
5.	Facebook						

3. How you utilizing information retrieved from Internet? Please assign the rank on the basis your preference

S. No.	Utilizing Pattern	Yes	No	Rank
1.	By noting down			
2.	By discussing it with friend			
3.	Retain in the memory			
4.	Download in the CD/Pen drive/computer/ mobile			
5.	Taking a print out instantly			

4. Please give the following information about the extent of utilization of the internet

S. No.	Particulars	Regular	Rarely	Never
1.	E-mail			
2.	Information			
3.	Knowledge of current affairs			
4.	Career Opportunities			
5.	Preparation of Resume			
6.	Entertainment			
7.	Academic Purpose			

Television: Are you watching Television – Yes/ No

1. If yes; then what is the purpose of watching Television? Please assign the rank about the following purpose on the basis your preference

S.No.	Purpose	Yes/No	Rank	S.No	Purpose	Yes/No	Rank
1.	News channel			2.	Entertainment		
3.	Health related Information			4.	Current affairs Information		
5.	Religious Information			6.	for particular programme(serials)		

2. What are the Channels preferred for watching? Please assign the rank of the following channels on the basis of your preference

Channels	F	%	Channels	F	%
News			Entertainment		
DD News			DD-1		
ABP News			Star Plus		
Aaj Tak			Zee TV		
Zee News			Sony		
NDTV			Colors		
Sports □			Others		
News sports			National geography		
Ten sports			Discovery		
Others			others		

F (Frequency), % (Percentage)

4. How you utilizing Information after watching Television? Please assign the rank on the basis of your preference

S.No	Utilizing Pattern	Yes / No	Rank
1.	By noting down imported information		
2.	By discussing it with friend		
3.	Retain in the memory		

5. Please give the following information about the extent of utilization of the television

S. No.	Particulars	Regular	Rarely	Never
1.	News			
2.	Entertainment (Music, Television serial, movies etc.)			
3.	Sports programmes			
4.	Agriculture programmes			
5.	Current affairs Information			
6.	Political events			
7.	Educational purpose			

Radio: Are you regular listener of Radio – yes / No

1. If yes; then what is the Purpose of listening Radio? Please assign the rank on the basis of your preference

S.No.	Purpose	Yes/No	Rank	S.No.	Purpose	Yes /No	Rank
1.	News			2.	Entertainment		
3.	Current affairs			4.	Political events		
5.	Job vacancy			6.	Others		

2. What is the programme often listened on Radio? Please assign the rank on the basis your preference

S.No.	Programmes	Yes / No	Rank
1.	Songs		
2.	News		
3.	Special feature		
4.	Sports commentary		
5.	Agriculture programmes		
6.	Others		

3. How you utilizing Information after listening Radio? Please assign the rank

S.No	Utilizing Pattern	Yes / No	Rank
1.	By noting down imported information		
2.	By discussing it with friend		
3.	Retain in the memory		
4.	Use it for preparation for the competitive exams		
5.	Others		

5. Please give the following information about the extent of utilization of the radio

S. No.	Particulars	Regular	Rarely	Never
1.	News (Sports News, Regional News etc.)			
2.	Youth Programmes			
3.	Entertainment (song, commentary etc)			
4.	Employment News			
5.	Agriculture programmes			

Mobile: Are you regular user of mobile – Yes/No

1. Please provide following information about utilization of your mobile (Other than calls)?

S. No.	Category	Yes /No	S. No	Category	Yes /No
1.	Send and receive text message/MMs		2.	Play games	
3.	Take picture		4.	Play music or MP3 films	
5.	Play videos		6.	Record videos	
7.	Access the internet or web site		8.	Send and receive mail	
8.	Listen radio Programme				

2. What is your purpose for utilization of mobile?

Category	Frequency	Percentage
General purpose		
Contact with parents		
Social interaction		
Contact with friends, batch mates and colleagues		
Internet or web usage		
Download songs and videos or ring tones		
Get News or weather online		
Send and receive mail		
Information about Job		
Face book , whatsApp		
Information about books, movies or other leisure Activities		
Other (photography, health and medical services)		

3. Please give the following information about the extent of utilization of the mobile

S. No.	Category	Regular	Rarely	Never
1.	Send and receive text message/MMS			
2.	Play games			
3.	Take picture			
4.	Video record			
5.	Play music or MP3 films			
6.	Play videos			
7.	Access the internet or web sites			
8.	Send and receive mail			
9.	Download songs and videos or ring tones			
10.	Get News or weather online			
11.	Face book , whatsApp			

PART – “D”

Q.8. Problem:

Are you facing any general or specific problem during the use of ICT tools: **Yes /No**

If yes, then please provide the following information about the problems:

Problem	Always	Some times	Never
Monetary problem			
Inadequate internet facility			
Read only content			
Cannot download full article			
Internet connection is poor/ low			
Sometime article available only in abstract form			
Difficulties in find out the free and paid online service			
Low network on mobile phone			
Problem in setting the frequency of radio channel			
Unwanted service activate in mobile			
Continue work on internet causing Eye pain, Back pain, Headache and Hand pain.			
Any other.....			

Q.9. What is your suggestions for effective utilization of ICT tools:

1.
2.
3.
4.
5.

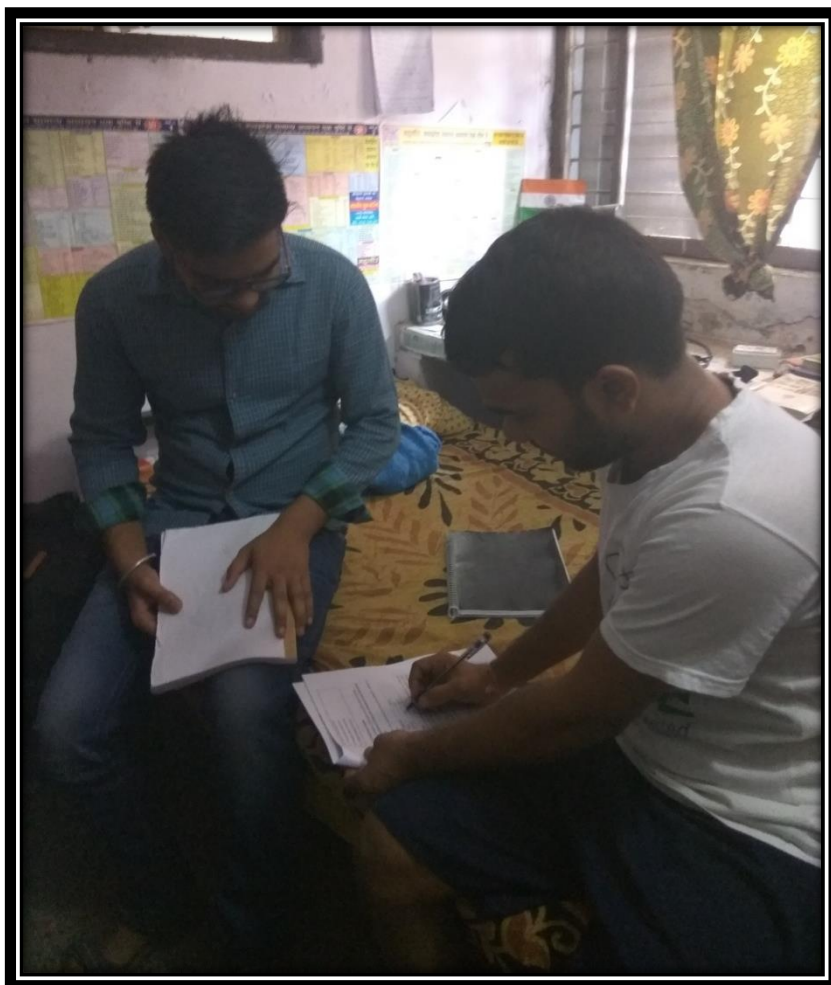


Plate - 1. Collection of data

CURRICULLUM VITAE

The author of this thesis **Mr. Prince Thakur S/o Lokchand Thakur** was born on 24th January, 1994 at Birholi, block Barghat Dist. Seoni (M.P.). He passed the High School Examination in the year 2009 with 55.00 percent marks and Higher Secondary Examination in the year 2011 acquiring 71.60 percent marks. Then, he joined IGKV at Faculty of Agriculture and completed his B.Sc. (Ag.) from Raigarh, Chhattisgarh during the year 2015 with 7.10 OGPA out of 10.00 point scale.



After completing graduation, he took admission for M.Sc. (Ag.) in College of Agriculture, Jabalpur in the year 2015 specialization in Extension Education. He has successfully completed the entire courses requirement for master's degree from Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (MP) 482004 during the year 2017.

For the fulfillment of the master's degree programme he was allotted with a research problem entitled "**Utilization Pattern of ICTs by The Agriculture PG students of College of Agriculture, JNKVV Jabalpur (M.P.)**" This is duly completed by him and presented in the form of this thesis.

ABSTRACT

Utilization Pattern of ICTs by The agriculture PG students of College of Agriculture, JNKVV Jabalpur (M.P.)

Name of the student – Prince Thakur

Name of Advisor – Dr. V.K. Pyasi

Designation – Chairman of the Advisory Committee

Name of College – Jawaharlal Nehru Krishi VishwaVidyalaya, Jabalpur

Key Words – *Utilization ICTs and Pg students*

The present investigation entitled was conducted in (2016-17) College of Agriculture JNKVV Jabalpur (M.P.) from list of respondents 120 students were selected randomly for this study. The ICT tools selected for the study were Internet/Web services, Television, Radio and Mobile. The data were collected through personal interview and analyzed by using appropriate statistical methods like mean, percentage, correlation and multiple regression analysis etc. for the interpretation of the data.

Result of the study revealed that half of the respondents (65%) male and (35%) female students, (30.53%) other backward class, family back ground from village in Hindi medium and had biology as major subject. It was observed that half of the respondents' majority of students belonged to the educated family. The study showed that majority of the respondents belonged to family of Govt. service, having their annual family income in the range of Rs. 3, 00,001 – 4, 00,000. The average monthly expenditure (excluding fees) found in the range between Rs.3001-4000, Data regarding accessibility of selected ICT tools, cent per cent students had mobile phone, followed by internet. Perception towards ICTs having favorable perception about ICTs and majority of respondents were more favorable attitude towards ICTs.

The study showed that majority of the respondent were getting awareness about ICT tools from friends and relatives and highly aware about mobile. Regarding use of selected ICT tools, students were highly using mobile followed by internet, television and radio. Majority of the students medium extent of utilization. Independent variables i.e. sex language in school education, monthly expenditure pattern, family background, knowledge about ICT tools, family annual income were to be significantly correlated with extent of utilization ICTs. Multiple regression i.e. sex, subject 10+2, monthly expenditure pattern and family annual income showed the significant contribution with extent of utilization of ICTs. Major constraints perceived faced poor internet connection, low network on mobile. To overcome the constraints, majority of the respondents suggested the internet should be improve, network of internet/mobile/radio channels should be strong.

Signature Prince Thakur	Signature Dr. V.K. Pyasi
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ABSTRACT

1. Title of the thesis : **“Utilization Pattern of ICTs by The agriculture PG students of College of Agriculture, JNKVV, Jabalpur (M.P.)”**
2. Degree Awarded with Subject : M.Sc. Agricultural Extension
3. Year of Award of degree : 2017
4. Student
Name : Mr. Prince Thakur
Enrollment No. : 150106007
Postal address : At-post Birholi, Block- Barghat, Dist –Seoni (M.P.) 480771
E-mail and contact number : prince.thakur765.pt@gmail.com
+91-9770904080
5. Advisor
Name : Dr. V.K. Pyasi
Designation : Professor
Email and contact number : vinaykumarpysi@gmail.com
+91-9424309922
6. Members of Advisory Committee : Dr. N.K. Khare
Dr. A. Shrivastava
7. Name of the department : Extension Education
8. Name of the College : Jawaharlal Nehru Krishi ViahwaVidyalaya,
College of Agriculture, Jabalpur
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Signature
Prince Thakur

Signature
(Dr. V.K. Pyasi)
Chairman of Advisory
Committee

Signature
Head of the section
(seal)

Signature
(Dr. N.K. Khare)
Professor and Head
of the Department
(seal)

